

AVIATION WEEK

A MCGRAW-HILL PUBLICATION

APRIL 4, 1955

50 CENTS

THE BEGINNING OF A NEW FUTURE

America's first jet transport, the Boeing 707 prototype, has already flown higher and faster than any other transport airplane.

Projected commercial versions would carry up to 130 passengers, cross the Atlantic in under seven hours and the U.S. in less than five.

The military tanker version, the KC-135, has been ordered by the Air Force and production is already under way.

America's first jet transport incorporates many revolutionary features as well as a great many proven ones in her design. One of the latter is her fuel gage system—the Honeywell Electronic Fuel Measurement System.

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Electronic Fuel Measurement Systems for aircraft and missiles—including the new transistorized version—represent only one of the many Honeywell products in our line of controls for everything that flies. We expect the list to grow longer in future years—because automatic controls are so important to aviation progress. And automatic control is Honeywell's business.

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RESEARCH KEEPS

B.F. Goodrich

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World's first 300 mph airplane tire —and it's B. F. Goodrich Tubeless!

B. F. Goodrich, inventor of the Tubeless Tire, announces a great new aviation advance—the world's first 300 mph airplane tire. Developed for ultra high-speed military use, the new Tubeless Tire established the record for a high speed landing on B. F. Goodrich's new 300 mph dynamometer in Akron, shown above.

To simulate the complex stresses of actual landings, this new B. F. Goodrich 300 mph Tubeless Tire was set to hit the dynamometer's flywheel at an angle. Stunned against the whirling flywheel under 10,000 lbs. load, it instantly

developed speeds up to 4,000 rpm—a combination of impact, friction and centrifugal force that would shatter any ordinary tire. After this 300 mph landing, the new Tubeless Tire showed no sign of failure. More landings were made, surpassing requirements for the test. And over nine 14-second landings at 300 mph, the tire was good for more.

The new 300 mph tire is the latest addition to the B. F. Goodrich airplane Tubeless Tire line. Already in military and commercial service, B. F. Goodrich Tubeless Tires speed maintenance, cut weight—saving as much as 75 per cent of tube weight. They give safer take-

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Instead of an inner tube, the BFG Tubeless Tire has a patented outer liner that runs part of the tire itself.

Results: There's no tube to blow out. No tube to add weight. And there's only one unit to mount and maintain.

This new 300 mph Tubeless Tire is another example of B. F. Goodrich leadership in Tubeless Tire research and development. The B. F. Goodrich Co., Akron, Ohio, has a branch in Los Angeles, Calif.

B.F. Goodrich
FIRST IN RUBBER

Vol. 42, No. 14

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properties of
AIRCORD

One section deals with the thermal properties of Niobium Alloys. It graphically illustrates the relative "change in length" with "change in temperature" of aluminum alloys and various types of stainless steel and carbon steel. Alloys . . . and shows the stainless steel type which most closely approximates the expansion rates of aluminum alloys.

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AVIATION WEEK • APRIL 6, 1993 • Vol. 62, No. 14
 Monday, April 6 and 7[illegible]

Small gas turbines pass test of time

New Milestones Gain Industry-wide Acceptance for AirResearch Power Turbines

At Research small gas turbine engines, first of this revolutionary class of turbomachinery to be developed, have now passed the following important milestones:

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two units capable of delivering either shaft or bleed air power independently of each other. Allison has more experience with small gas turbines than all other manufacturers combined.

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[illegible]



Aerla's new XP6M is a radical departure in airplane design. It features a narrow, elevated tail and jet angles swivel step the wings. Four Allison 271 engines with exhaust airbrakes push the XP6M to well over 400 mph and to altitudes of over 40,000 feet. Clifford supplier is shown at right.

Martin XP6M's Cockpit Temperature and Anti-icing Controls Have Novel Features



Aerla's new XP6M is a radical departure in airplane design. It features a narrow, elevated tail and jet angles swivel step the wings. Four Allison 271 engines with exhaust airbrakes push the XP6M to well over 400 mph and to altitudes of over 40,000 feet. Clifford supplier is shown at right.



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Aerla XP6M, why and why controls are polished against heat. Aerla's new XP6M is a radical departure in airplane design. It features a narrow, elevated tail and jet angles swivel step the wings. Four Allison 271 engines with exhaust airbrakes push the XP6M to well over 400 mph and to altitudes of over 40,000 feet. Clifford supplier is shown at right.

New Clifford system employs lightweight control box with unitized construction, miniaturized components, novel probe element, and unique skin temperature sensing elements.

In addition to its small size and light weight, Clifford's new control box design embodies several important advantages in service. Unitized construction makes it comparatively simple to locate a malfunction in service, quickly replace the unit containing the defective component, and get the plane back into the air.

Miniaturized, ruggedized components result in the smallest, lightest control possible for the job to be done. Elements within the box comprise an amplifier, which is highly compact and potted in resin, a novel probe element smaller and lighter than comparable units, valve relays to operate valve actuators, a power supply, a modulation unit for the electrical bridge, and a radio noise filter.

Physical and electrical designs are both concerned with the performance-in-service factor. Electrical input values are held to optimum levels to insure long trouble-free service. Physical arrangement of parts promotes maximum heat dissipation.

New skin temperature sensing elements, smallest such units ever

made, are fastened to the skin to insure close, accurate sensing and control and protect the PDM against icing hazards.

Complete system of Clifford design and manufacture encompasses temperature sensing elements, temperature selector, and control box. On the PDM, wing and tail anti-icing systems are controlled with a common control box. The cockpit temperature control system is entirely separate, having its own control box, sensing elements, and associated high temperature air valves.

Information or consultation involving temperature control systems custom-built to the requirements of specific aircraft on which you may be working is available without obligation.

Write: Clifford Manufacturing Company, 136 Grove Street, Waltham 54, Mass. Division of Standard-Thomson Corporation. 124



Domestic

American Airlines last week ordered an additional 14 DC-3s from Douglas Aircraft Co., will take delivery on the new transports in 1955 and 1957. When the orders are accepted, American will have a fleet of 19 DC-7s, 52 DC-6 types, 75 Convairs and nine DC-4s.

New York's LaGuardia Airport will resume all aircraft operations at the field after May 1 to have two-way radio capable of reaching the control tower on both ground and background VHF channels.

For American World Airways' Strato-Cruiser, ditched 10 miles off the Oregon coast May 25 after the No. 3 engine shook loose from the wing.

New \$1.5-million collection and test building for rocket engines is being constructed by North American Aviation at the company's propulsion field laboratory south of Los Angeles. The facility is scheduled to be completed July 10 and activated late this summer.

Five Sikorski HO4Ds will take off Apr. 17 from Camp Buckner, Ala., on a 15-day delivery flight to Ft. Kobbe in the Carolinas. The Army helicopter will be demonstrated en route for government officials of Cuba, Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica.

Chance Vought Aircraft, Inc., Dallas, received a "march order dollar" sub-contract from Boeing Airplane Co. for production of modified B-47 nose sections.

First F2V-5 Neptune of a contract ordered by the Royal Canadian Air Force will be delivered by Lockheed Aircraft Corp. at Burbank, Calif. ACAP's maintenance assistance service will use the bomber for anti-submarine and carrier patrol.

United Air Lines will offer oceanic overnight service under a new agreement with Air Express International Corp.

Stress analysis of propeller blade retention system will be studied by the Illinois Institute of Technology at Chicago under a \$28,000 research grant from USAF's Wright Air Development Center.

AC Spark Plug Division, General



Vector-System Helicopter Is Easy to Fly

Vector-system system conventional cyclic pitch controls on the de Lachard D804 helicopter. Prototype weighs 180 lbs., production versions are expected to weigh only 125 lbs. Two 254-hp. diesel engines beneath the pilot are driven by a 304-hp. Kichler-Morrey turboshaft engine. Top speed is estimated at 65 mph and range at 15 miles. Helikopter Bell registers Inc. is among other companies developing helicopters in hopes of Navy and Marine contracts.

Motors, Milwaukee, has ordered the helicopter fuel control system, with initial tests scheduled for September. Fuel control work formerly was done by GM's Products Division at Rochester, N.Y.

Financial

Time World Airline reports a record net income of \$10,716,312 for 1954, double the previous year's \$5,004,792. Gross for 1954 was \$23,471,295 compared with 1953's \$17,710,966. TWA won the record profit was achieved without federal aid, making first time a U.S. or foreign flag carrier has achieved subsidy-free income since 1945.

Northwest Orient Airlines' net income for 1954 totaled \$2,415,828, increasing from \$1,944,691 the previous year. Operating revenues amounted to \$61,795,351, compared with \$61,915,418—net excluding \$4,184,588 from the Pacific airmail. Operating expense dropped to \$58,384,514 from \$61,996,990. For the first time since 1947, NWOA had no outstanding book loss or long-term debts at the end of the year.

Kaiser Aircraft Corp., Bloomfield, Conn., declared a 10-cent dividend, payable Apr. 15 to stockholders of record Apr. 5.

International

First preproduction Vector of Saco's SO-4070B bomber aircraft was delivered to the French Air Force at M'An Villardouche air base. Powered by two 6,160-hp. Bristol Siddeley Atlas 101 turboprops, the Vector has exceeded 520 mph during test bombing runs.

Earlier troubles may keep West Coast Canada's Lufthansa from starting operations this month. Negotiations between the airline and Canadian transport unions broke down after long negotiations rejected Lufthansa's wage offers, reported to be about 75% of the average for air carriers in northern Europe.

Two Super Constellation 1049s, owned by Branch Aviation Airways Corp. and Sealed and Western Airlines, started service Apr. 1 to BOAC's New York-Buenos Aires route.

Britten's Flight Refueling, Ltd., plans to build a pre-production plant in Canada, probably at Toronto. The new manufacturing facility will be operated by the company's subsidiary, Flight Refueling (Canada).

Guided Munition will be developed by Canada's Avco Aircraft, Ltd.

WHY SPOT FACE AWAY THE FITTING?



Excessive spot facing, weight, and bulk are eliminated from removable fittings such as aircraft large brackets, when HI-SHEAR stud rivets are used to carry the shear loads. On the above example four bolts spaced up removal or installation of the fitting is the shop or on the flight ramp.



Fittings using bolts in carry the shear loads, require spot facing in the areas. These fittings must be heavier in weight to retain strength to avoid stress concentration and are larger in size to obtain bolt clearances. In example, the fitting with bolts suffers a weight increase of about 30% and requires removal or installation of an additional fourteen bolts.

WRITE for the HI-SHEAR Standards Manual for specific data on the HI-SHEAR stud rivet.

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April 4, 1955

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WHO'S WHERE

In the Front Office

Robert B. Murray, Jr., Senior Counselor Undersecretary for Transportation, has recently moved Raleigh-Leno Hamilton Corp., New York, to special assistant to the president.

Stanley C. Kennedy, Jr., will resign as president of American Airlines next July to become chairman of the board. His successor will be Arthur De Loach, who joined the airline last month as executive vice president.

Garben M. Rose, former director of Civil Aeronautics Board's Bureau of Air Operations, was elected executive vice president of Shick Aircraft Corp. in New York. John S. Allison, vice president of Northrup Aircraft and former Assistant Secretary of Commerce, was elected president of the U. S. Treasury.

Charles H. Callahan became vice president engineering and maintenance for General Aircraft Lines.

Changes

George G. Kahn, Jr., was appointed senior advisory engineer for Westinghouse Electric Corp.'s Air Arm Division, Baltimore. John Clayton Hackett, Jr. is now, vice president of production, Texas Cast, in regard to the engineering company.

Dr. Carl L. Rabin, who helped develop General's Westinghouse F-104, is now chief of the Systems in World War II and has worked at USAP's Wright Air Development Center since 1945, post General's work to take charge of airborne systems evaluation for the Merckel Division, Massachusetts.

Ronald M. Rosen moved up to General Motors Corp.'s Allison Division as Indianapolis from engineering director to technical assistant to the general manager.

Donald E. Hines, chief engineer of the turboprop, is now director of engineering. Additional changes in aircraft engine operations: R. E. Smith and L. M. Smith, executive engineers at G. I. McDowell, chief engineer of advanced design and development; J. B. Wessley, assistant chief engineer of advanced design; G. E. Hines, chief engineer of turboprop; J. E. Goss, chief engineer of fuel systems; J. C. Schmidt, assistant chief engineer.

Jack W. Geller is now general manager of Dallas Aviation, according to W. D. Foster, Jr., who resigned.

John Olson was promoted by Avco, Calhoun, national airline, to traffic and sales manager.

Honors and Elections

Dr. Theodore Van Kester, professor of aeronautics sciences at California Institute of Technology, Berkeley, was elected to a life honor membership in the French Academy of Sciences and elected to the rank of full commander in France's Legion of Honor.

INDUSTRY OBSERVER

► Wright R-55 Suppressor turboprop smoothly survived a rugged emergency on the Lockheed P-3H at Edwards AFB, Calif. Tests LeVine, Lockheed test pilot, was making gun firing runs with the F-104 when an ejected cartridge hit a ported hole in a fuel tank. Rare fuel sprayed into the Suppressor air intake where it was ejected into the engine, causing extremely rough running. LeVine managed to bring the plane in for an emergency landing on the dry lake bed. Suppressor indicated no damage from this rugged accident.

► Boeing's new order for KC-135 jet tankers (AW Mag. 7, p. 13) means to 166 planes. This is in addition to the original program for 46 tankers established when USAF gave Boeing its initial KC-135 order last year. KC-135 program now calls for 257 aircraft.

► FiatAvco Aircraft Corp. design studies for large helicopter are aimed at 31,000 lb. gross weight and a 1,000 ft. payload. Current helicopter heavy-weight is the Panavia H-15 at about 31,000 lb.

► A new in-flight refueling system, using two cross-rod tubes and a ballpoint configuration to replace the currently used, refueling hose, has been patented by Flight Refueling Inc., Baltimore, Md. Company makes probe-and-drogue in-flight refueling equipment (AW Jan. 26, 1953, p. 28).

► TF-103, General's interim version of the supersonic interceptor, is scheduled to fly in October at Edwards AFB. Calif. has subsonic version, will carry two main weapons, have two for control system as F-102 and will be fitted to take full advantage, indicating first in emergency, with its super sonic speed, it could be used for combat attack.

► Canada's Avco Aircraft will fit General's F-106 with experimental turbine thrust augmentor (bearing within tailpipe) for about 15% boost in power, an association with Macquart Aircraft Co. developed variable-orifice, turbine nozzle, primarily used to give exhaust opening for optimum specific fuel consumption during cruise. In-type unit also built good pressure for replacement turbo reverse thrust device, in addition to its basic jet exhaust nozzle.

► Republic F-105, supersonic fighter-bomber, probably will be rolled out in about three or four months. Plane will incorporate wing root air inlets for its Allison J71 turbojet engines.

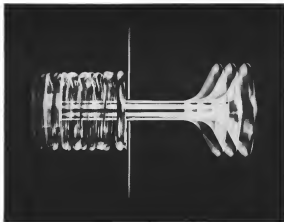
► Avco Canada's C-105 long-range interceptor is scheduled for rollout this fall. Initial quantity will consist of one static test article and two prototypes. Additional schedule for 15 more of the planes may come soon. Plane will be fitted with Hughes fire control system.

► Ryan jet-powered Finkester target drone may be used for photo reconnaissance work and as a combat vehicle with own guidance. Plane should have good tactical potential because of its performance—over 600 mph. speed, more than 40,000-ft. altitude, 1 hr. 20 min. duration, 500 lb. payload.

► Hughes Aircraft's Falcon missile is being refitted with a streamlined radome with good electronic characteristics, replacing the round hemispherical radome shown on recently released Falcon pictures. USAF pilots who are the assessors of the Falcon operating against jet F-400 drones were startled by its effectiveness.

► Cornell Aeronautical Laboratory is conducting windtunnel tests on the Convair F10-9 Tiger, Navy's supersonic fighter. Windtunnel tests are being made to obtain more accurate engineering data on the F10-9. More than 150 lb. of test time have been logged in the variable-density windtunnel, all of it in the transonic range.

► French Cessna H-15 delta wing prototype of a forthcoming supersonic fighter, which has been flying with a new wing of increased span, has exceeded Mach 1 in level flight. Cessna H-15 exhibits much shorter takeoff and landing characteristics than the earlier H-15.



Vacuum-melted alloys WORK LONGER with less "fatigue"

Vacuum-melted alloy steels in valve springs, bolts, landing gear—any part subject to cyclic stressing—far outperform conventional air-melted alloys. For vacuum-melted metals exhibit exceptional fatigue properties—even when heat treated to near maximum limits.

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Washington Roundup

Shakeup in Pentagon

Responsibility for major shakeup in military public relations, which hit the Pentagon a hard blow last week, actually gets in the White House, where two senior Navy representatives left last week, including one on the President. Defense Secretary Charles E. Wilson took the bull by the horns after getting a dressing down from his boss, then made all the decisions and is reported to have written the directives himself.

Paraphrasing words of all the trouble, Adm. Robert G. Cooney's use of a small press conference to give the public his opinion about the importance of war with China and Gen. Eugene P. Wilkinson's forthcoming series of articles for the Saturday Evening Post on the atomic submarine.

First directive from Wilson's office put a curb on military people who want to talk or write for publication, ordered them to get clearance from the civilian secretary of their own service before talking or writing. Verbatim created some confusion in public information offices but while the document went on the second bombshell dropped. It was no order calling for overall reduction of one-third to one-half in information staffs and replacement of top military officers by professional civilian public relations personnel. Men to be replaced are Army's Maj. Gen. Glenn C. Wadsworth, Navy's Rear Adm. William G. Bruchman and USAF's Brig. Gen. Harold E. Allen, who was in the process of giving his chair to Col. Robert Lee Scott (AW Feb 28, p. 12).

Indications are that none of the services were consulted, at least at the confirmed level, and the changes came as a surprise. Still awaiting clarification is Wilson's declaration that everyone in the department will be held personally responsible for seeing that information they release is "consistent with the national security and the policies and objectives of the Department of Defense."

Wadsworth seems to be interpreted as a gag on critics as Wilson's view that there must be a determination of whether release or production of the material would contribute a constructive contribution to the primary mission of the Department of Defense.

Preparedness Investigation

Senate Armed Services Committee has revived its Preparedness Investigating Subcommittee, which made top news with its reports on the defense program in the last Democratic Congress (H&A 55). Five members joined in the group also moved on the old investigating subcommittee: Sen. Lyndon Johnson, chairman; Sen. John Stennis, Sen. Estes Kefauver, Sen. Styles Bridges and Sen. Leverett Saltonstall. The two new members are Sen. Stuart Symington and Sen. Ralph Flanders.

Two subjects the subcommittee is expected to consider are the guided missile program and AFM. Stennis and Symington have already recommended their investigations (AW Mar 7, p. 14).

More Airline Audits

Civil Aeronautics Board plans to increase its audit of airlines of its fiscal 1956 budget request of \$4 million is approved by Congress. This is about \$100,000 more than CAB has this fiscal year. CAB member Chas. Gurnea told Senate Appropriations Committee that audits of scheduled carriers would be made every year and audits

of non-scheduled lines, every other year. At the present time, scheduled carriers are audited once every year; non-scheduled, every third year.

Senate confirmation objected to the action of House Appropriations Committee in cutting CAB's request to \$11.2 million for subsidy payments from now until July 1 to \$5 million.

Army Sensitivity

Creation of new Aviation Division in Office of the Assistant Chief of Staff, Operations (G-3) (AW Mar 21, p. 20), already has resulted in consequent hitting Army in a highly sensitive spot, something that the act setting up their own Air Force. Pentagon observers feel Army's interest in aerospace elements of its aviation activity in new status was due to its exposure to avoid job loss, quotes from Congress while budget is under consideration.

Brig. Gen. Randolph H. Howe, chief of the new division, has returned from his recruitment tour of Army air establishments, ready to make a tough job selling for maximum display of skill in the through military and legislative file that is bound to burst loose.

Little known fact about the Army's new aviation chief, which proved an interesting quirk of history, is that he is not a military man. Gen. Robert Lee Howe. Through courtesy, Gen. Robert Lee Howe was promoted to the 9-star rank that court-martialed B-29 Mitchell, instead sent out of the Army for recombination on an active case.

Fewer USAF Generals

Air Force plans to increase the number of general officers from 410 to 440 during the next fiscal year have been dropped. A Senate Armed Services Subcommittee has recommended a ceiling of 425 on the number of USAF generals by July 1956. For the other services, the subcommittee recommended these ceilings on general officers as of that date:

- Army, 494. This is the number planned and two less than the present 496.
- Navy, 287. Navy planned 290, at present has 284.
- Marine Corps, 60. This is the present number and the number planned.

Airport Tangle

Despite not a solution to Washington's crowded airport involves employees with no sign that recommendations of the Presidential Advisory Committee offer any substantial answer (see p. 21). Chief planning blunder is a suggestion that Baltimore's Friendship Airport be used as an alternate to Washington National Airport to relieve congestion.

Maryland Senator John Marshall Butler has picked up the ball in the effort to force the airlines to use Friendship, but he has hit a stone wall with the carrier. In a meeting with Butler, airline representatives told him the idea just won't work and he might as well forget it.

In answer to a Butler request for Civil Aeronautics Board action, Acting Chairman Joseph P. Adams told Sen. Butler the Board had the power, and that the staff is studying the matter. He also said that in view of the difficulties involved in such a proceeding, the CAB isn't at all convinced it should go ahead with it.

—Washington Staff

CAB Examiners Restrict Nonsked Role

Possible certifications for irregulars hinted; special and charter flights would be authorized.

By Craig Lewis

A debate, restricted sphere of operation for unscheduled airlines is now being opened by two Civil Aeronautics Board members in the nation's irregular air carrier case.

The commission, Ralph L. Wiser and Richard A. Walsh, have written a report which brings center to completion the longest, longest case the CAB has ever processed. It has run 42 months and 50,000 pages of testimony.

The report didn't open up any new horizon for the irregular, although there is a hint of possible future regulation, but it did define specific status and area of operation.

► **New Classification**—Under the commission recommendations, irregular would be classified Large Supplemental Air Carriers.

Two types of supplemental and char-

ter operations would be authorized:

- Charter Service would involve transportation of persons and property on scheduled flights for a flight for the charterer's own account. A carrier could charter one full or more of an airplane's capacity to a charterer and could use the remainder to fill another charter of full or more of airplane capacity. No restriction of frequency or irregularity would be applied.
- Special Service would involve special types of air transportation, but would be subject to restriction of these flights in such direction between any two points that a scheduled service.

A time limit of five years is suggested for the supplemental authorization as an adequate period to allow the carrier to develop this type of operation and give the CAB a period to review its status in developing an future action.

The report recommends an ex-

change to serve as a clearing house for charter information. Such a plan is currently under consideration by the Board in a separate case.

CAB Authority

In recommending these forms of service for irregulars, the commission held that CAB does not have the power to issue regular certificates of public convenience and necessity for supplemental service. This stand is based on the finding that under the Civil Aeronautics Act, regulations must define routes and points to be served and cannot specify limitations on operations such as those applied to supplemental service.

No such limitations are found in the Board's exemption powers, however, and the proposed authorizations would be issued as exemptions, rather than certificates.

The proposed regulations would not permit intrastate operations of the North American Airline type, but they would have little effect on the other operations conducted by the majority of irregular carriers. Conversely, the industry does about 10% of its business as commercial charter and often the rest between common carriage and military traffic.

Background

Most irregular carriers escape in such way. Estimates in the report show that the irregulars get nearly half the yearly business done by commercial airlines and make between 40 and 50 million dollars a year.

The Large Irregular Air Carrier Investigation was started in September 1951 as a general probe of the situation. Its purpose was to determine what role, if any, the irregulars should have in the nation's air transportation pattern. It is a need for their services was found, the investigation was to assign their status, decide which applicants should conduct the services and define the regulations under which they would operate.

When all the states and parties had been consolidated, the proceeding wound up with 68 applicants, 25 intervenors and CAB's Bureau of Air Operations participating, and with 106 questions resolved.

► **Experimental Period**—A great variety of services were asked for by the applicants. The commission concluded that

it would be in the public interest to authorize charter and special service transportation "by the qualified operators of large aircraft for a period allowing a reasonable opportunity to experiment and develop further this transportation."

The report also states 33 irregular carriers which should get the new authority and 27 which should not.

At the end of 1953, evidence on the qualifications of half the 68 applicants had been taken. At that point, the CAB decided it had enough of a cross-section of the industry to make a judgment on its place in air transportation and, in the interest of speeding a decision, decided to stop taking evidence on individual carriers and concentrate on the general issues.

Judgments

Wiser and Walsh make individual judgments on the 30 carriers which were individually examined. Of these, 17 were found qualified and 13 are qualified for the proposed new authority.

On the remaining 30 applicants a "grandfather" standard was used. Those carriers which were operating in the last six months of 1954 were recommended for supplemental service authority. Those which didn't operate at that period were rejected.

In the final count of 27 carriers whose applications were found inconsistent with the public interest, five are operating companies—All Air Service, Air Service, Air Transport, Great Lakes Airline, Modern Air Transport, and the United Export Co.

Conflict Develops in Congress On Handling Tacan-DME Dispute

Congressional efforts to resolve the dispute between the military Tacan staff and the civilian DME staff have been delayed by the dispute over the status of the Tacan-DME system, which is being developed by the military.

The Senate seems to have a joint Congressional investigating committee to determine the various independent committee inquiries of the military staff. Neither of the two House committees working the Tacan-DME controversy have expressed any desire for a joint group.

► **Senate View**—However, the Senate Commerce Committee last week approved a concurrent resolution for creation of a special joint committee to study the existing common system of air navigation and the proposed changes recommended by the Air Navigation and Development Board. Chairman Warren Magnuson said

► **New Entry Policy**—Included in the recommendations is a set of proposed rules and regulations under which the large supplemental Air Carriers would have to operate.

In dealing with the question of entry of new air carriers into the certificated area, the report comes up with a recommendation that the CAB adopt a policy in the area. It is suggested that the order should be that based on general agreement be issued to consider expansion of the number of certificated carriers on a route when the volume of Large Supplemental Carrier traffic exceeds 15% of the certificated carrier traffic on the route for a substantial period.

Large Supplemental Carriers responsible for the traffic could apply for and get a certificate in such a proceeding if they made the necessary showing.

► **Incipient Unhappy**—Another recommendation is that the CAB conduct an informal investigation of such services on transcontinental and west coast routes of American Airlines, Trans World Airlines, Eastern Air Lines, and Western Air Lines in relation to available traffic. The investigation would determine whether a formal CAB proceeding is justified to require the carriers to increase route service.

The irregular carriers may not be happy with the findings of the commission. They consider the recommendations too restrictive, and will probably campaign for some modification of them when the CAB comes to make its final decision. Irregulars hope that congressional action will establish some type of service for them that will be more liberal than that advocated by the report.

Settlement Bid

North American Airlines' latest move in its ongoing fight with Civil Aeronautics Board for control in a transcontinental operating unit was a proposal to the Board to settle the two-year-old enforcement case.

CAB is considering an executive's recommendation that the airtight deal group be authorized to withdraw from the Civil Aeronautics Act (AW 48, 24, p. 100).

North American's proposal to settle is a very timely one now repeated by CAB a year ago. The Board again is asked to demand the enforcement and compliance provisions, then North American would consider settling their letter of agreement.

However, the concluded group proposal to continue authorized operations pending final decision at last possible certificate expiration date. The offer provides that no more than one aircraft would be operated, the number now owned.

From House and Senate and the vehicles down from the commission on Appropriations Armed Services, Commerce and Foreign Relations. It was further intended to require an informal report on later than June 30 and a report on the 31, 1955, at which time the plan committee would be expected to be on record of \$125,000 would be authorized.

Observers predict Senate Secretary General will be the resolution of the Senate Rules Committee. However, expectations are that when the House refers it to its Rules Committee, the resolution will be passed.

► **House New Rule**—In the meantime, the transportation subcommittee of the House Commerce Committee plans to wrap up its hearing phase of the Tacan-DME dispute. Final witness before chairman C. D. Harns' group is to be Mrs. Kase, assistant general manager of the American Overseas & Pilot Lines, as opponent of Tacan.

The House Commerce Committee perhaps has made the most extensive investigation of any of the investigating committees and strongly feels the subject falls within its jurisdiction.

They don't prefer to have complete technical knowledge but are relying heavily on the testimony of the many reliable technical experts who have appeared before them.

Rep. Gen. Milton Eisenhower, Air Transport Area vice president, summed up the controversy for the committee with a challenging question: "Are the other military services ready to be taken into the committee's sphere, expressed by

Magnuson Plan Favors New Air Carriers

A new proposal stressing the right of any entry into transportation has been introduced by Sen. Warren Magnuson, Chairman of the Senate Interstate and Foreign Commerce Committee.

Both Magnuson and Chairman Percy Frost of the House Interstate and Foreign Commerce Committee have stated that the rule of unscheduled carriers will favor irregularly at least this session (AW Mar. 25, p. 14).

Magnuson's proposal made it an amendment to an omnibus civil aviation bill which he did not intend to introduce.

► **Part**, namely the definition of policy in the 1955 Civil Aeronautics Act to emphasize the "competitive" goal of air transportation development.

Magnuson's proposal demands "the encouragement and development of a competitive air transportation system . . ." It adds a provision that regulation shall "favor the growth of competitive economic conditions." (The 1955 act does not include "a competitive" and states only that regulation shall "favor sound economic conditions . . .")

While the 1955 act provides for "competition to the extent necessary," Magnuson's proposal provides for "competition to the maximum extent consistent with the economic characteristics of the industry giving full recognition to the benefits derived from the existence of new competitive carriers as promoting the sound development of an air transportation system meeting the needs of the traveling public."

► **Second**, the burden of proof would be shifted from the carrier to the Board in the event of certificate. Magnuson's proposal directs the Board to issue certificates "unless it finds that the applicant is not, in fact, willing, able and to perform (a) transportation properly and to conform to the provisions able to perform such transportation properly . . ." so that the public convenience and necessity will not be served thereby.

Another amendment introduced by Magnuson would establish a publicly administered, reporting to the CAB chairman.

Rep. Carl Albertson: "We'll just have to accept the military on their own terms. We're not going to judge the validity of military recommendations. To do so would be shifting a tremendous burden of responsibility."

■ **Most Accept Benton-Gra.** Arnold told the committee that the substantial amount of money required for the government to complete acquisition of DMIE cannot be justified unless it is concluded that VOR/DMIE will meet the military requirements.

If the VOR/DMIE will not satisfy the military, Gen. Arnold cautioned we have no choice but to accept the economic and operational burden imposed by the transition to Tacom in the interest of a common defense.

The committee expressed great interest in the fact the scheduled air loss had not produced sufficient DMIE sales despite their production and availability. Gen. Arnold said ATIS had estimated its market value at more than five years ago to be less DMIE because the Tacom conflict was forecast then. Gen. Arnold said he had personally pleaded with the Bureau of Budget as late as 1972 that the military should force CAA acquisition of DMIE in view of the brewing conflict.

■ **Another Work Order.** The ATA official told Rep. Hatcher that it was not his responsibility to turn other potential purchasers of DMIE, and that information as the dynamic was available publicly. He referred to an article in *Aviation Week*, Dec. 7, 1951, which Chairman Hatcher ordered included in the report.

When Gen. Arnold told the committee that ATIS cannot be destroyed by abandonment of civil DMIE, the committee shifted to possible compensation for the private corporate sector. They have heard of a \$6 million deal. No immediate solution was forthcoming but such a proposal for compensation to purchasers of good faith is being reviewed in an attempt to avoid dropping DMIE.

DMIE supporters, however, hope to return and continue the use of DMIE while the development of Tacom proceeds. A major effort is being made to sell the military a leaseback in the New York of the Air Commanding Committee. The New Panel is reviewing the ANDB Tacom decision for ACC with a report due Apr. 15.

Rep. Hatcher committee might take the resolution. The group has explored the DMIE question from all angles, having the final written. Their explanations included a Navy flight demonstration of Tacom. "It was no tactical performance," Rep. Hatcher reported. "A flight which included inspection of the Navy Tacom ground installation at Atlantic City, N. J."

Hoover Group Report Asks Single Military Air Transportation System

Return to a single military Air Transport Service, reduce use of commercial aircraft and set up the number of all military aircraft operated by the three military services, was today presented to Congress last week by the Hoover Commission.

Continuing the growth of "Empire Building" by air transport services such as the Navy's Fleet Logistic Air Wings, Air National Command's Log Air and the vast fleet of military transport aircraft is creating a waste of resources, the commission suggested that the Defense Department set up a Director of Transportation to supervise all transportation.

■ **Big Menus.** In a study of the MATS operations, the commission found that its routes paralleled those of the domestic and international airlines in all but a few instances such as in the Arctic and northern Canada. It said MATS operates 536 planes, 425 of them in the domestic service. The cost of Fleet 1958 was \$181,468,880, up from \$460,400,000 in 1951 and \$90,700,000 in 1952.

MATS personnel has grown from 38,797 in 1951 to 115,525 last June. In Fiscal 1954 it carried 1,837,300 domestic and 942,000 international passengers.

In a stress on the economies of the MATS system, the commission listed its expenses by the amount of money paid net by the government.

Recommendations

The Hoover Commission proposes the following changes in reference to air transportation:

- That the related services of MATS which duplicate those of other branches of the government be discontinued.
- That the Secretary of Defense issue a supervising and controlling directive to eliminate the duplicating air transport services within the Department of Defense and accept the same operation as MATS, except necessary administrative needs.
- That the number of administrative aircraft be drastically reduced.
- That the postoffice operations of the military MATS be inspected and collectively limited to general and stage services only in order to remedy the military air transportation and, only other commercial carriers have been offered to the maximum possible extent.
- That the military transportation on service carriers be authorized.

to schedule the commercial carriers.

By the report.

■ **Subsidy Reduction.** "If the United States international airlines were to obtain 75% of the passenger volume and 90% of the military cargo shown in MATS by Air Transport Service, we should for the fiscal year ended June 30, 1954, the international commercial carriers would have reduced their subsidy bill by \$42.5 million, almost 88% of the total amount."

According to the report, to the extent that MATS controlled its operations to comply with this proposal, the government would effect actual out-of-pocket savings through a proportionate reduction in MATS costs," the commission, which is headed by former President Hoover said.

The report pointed out, however, that steps have been taken recently by the Defense Department to give major carriers in 51% military service in commercial air transportation.

It made a strong point of the fact that airline subsidies are justified in part in the argument that federal money must support the carrier because of their importance in time of emergency—an adequate logical air arm of the "National Defense Establishment."

Odd Cargoes

In its MATS study, the commission says, up with these items:

- During July 1954, 13,000 lb of fertilizer was flown from Bermuda to the U. S. and in September 25,000 lb of coconut husk arrived the other way.
- A USAP band in Rome once a month from Westover Air Base, in Bermuda for dance and concerts.
- A cargo of prairie dogs has been flown from Westover to Berlin.
- A theater commander once reported MATS to fly a substantial quantity of dog food from the West Coast to Okinawa.

■ **Parade Routes.** The report cited the history of MATS, which was organized in 1948 through a merger of USAF's Air Transport Command and the Navy's Air Transport Service with the object of wiping out duplication and saving money.

■ **Naval Service.** Another Navy Service, a 4,000-man naval aviation activity called "Operation Questionnaire." This service cost the Navy \$2.5 million in 1954 paid to charter operations leaving C-46s from the government while at least one commercial airline was unable to get the business.

In a look at naval USAF operations,

the commission is critical of the Air Material Command's Log Air flights, deports. To distribute aircraft parts and accessories.

The report notes that blank forms, publications, drawings religious goods, electric equipment, medical instruments, lumber and laundry equipment help make up the cargo.

The report says Log Air carried 2,140 tons of cargo in June of last year and that most of it was of its operations can be carried out by MATS.

In the field of administrative flying, the commission's task force estimated that Defense Department aircraft operating under various commands carried 1,555,000 passengers between domestic fields in 1954.

Operations

Other criticisms on Defense Department air transport operations:

- In 1954 the Department generated about 8 million air passengers, of whom 6.5 million were businessmen or so "low status."
- MATS provides technical services of communications, weather information, air rescue and astronomical chart production that duplicate those of other government agencies.
- There is a great deal of MATS "load-

loading" but the service is trying to cut down on that in allocation of lines.

The Hoover Commission, known of itself as the Commission on Organization of the Executive Branch of the Government, even all forms of transportation in its report to Congress. The Defense Department gets the most share of attention not only in reference to air transport, but also in sections dealing with rail and water carrier operations.

■ **General Criticism.** Overall criticism of Defense Department transportation functions, summarized in a prelude to the recommendations that it be controlled by a single director, includes these points:

- Lack of recognition of the key importance of transportation.
- Failure to coordinate scheduling and procurement with transportation within and between the services.
- Present organization plus subordination transportation.
- Lack of review and improvement of operating performance.
- Wide and unimproved diffusion of technical functions.
- Too much military control.
- Inadequately trained personnel.
- Lack of statistical and management control data.
- Poor facilities for traffic management personnel.

Lockheed Gives Up Turbopropelled Connie

Lockheed Aircraft Corp. has scrapped the turboprop 1449 Super Constellation. In its place, the company plans to offer instead its new Model 1449, basically the 1449 but powered by 1,400-hp. Wright Turbo Compound piston engines.

A projection of the 1449, however, may be built for the military. Lockheed spokesman on the Navy is interested in its Model 1449, a stretched version of the 1449 with Pratt & Whitney Aircraft's T34 turboprop.

FAW's studies in engine from the civil transport when Lockheed bought the 1449's fuselage 135 inches ahead of load and space studies indicated the turboprop Super Connie could carry a heavier load than could be stressed under average densities. This longer vision became the 1575.

Pratt & Whitney said Lockheed wanted to pull too much extra power out of the T34 for the new model.

With an turboprop for a civil engine, Lockheed said, the extra 135 inches out of the Super Connie's fuselage and replaced the T34 with Wright's latest turbo compound B3350-EA1.



Navy Uses Flying Lab for Radar Studies

Navy's new flying lab, an F-100 carrying four winged radar radar sets, will be used for Naval Research Lab studies of radar and radar wave propagation. Efforts to test capabilities, which can be tested and learned in flight, focus on atmospheric conditions. Radar sets, which range from 5 to 10 bands, will be used to investigate backscattering properties of different targets. Aircraft may be used also in use of several of a one-way transmission but to investigate atmospheric scattering and "radio ducts." The latter is an atmospheric condition which provides extremely good radio transmission.

Air Defense Trying Out Missiles Armed With Atomic Warheads

U.S. Air Force and the Atomic Energy Commission are experimenting with an atomic warhead for anti-air and ground-to-air guided missiles, designed to protect the country against enemy bombers.

First test will be held during next summer demonstrations in Nevada, utilizing an air-to-air missile. The weapon was not identified by AEC but presumably would be the Thunderbolt or Douglas Sparrow, equipped with no electronic warhead.

► **Data for Defense**—As a preliminary, a test missile device was dropped from a B-36 bomber at 30,000 ft altitude into a patch of woods left by 40 ft diameter. It was assumed by observers that the pattern revealed the flight path of an enemy bomber fleet.

Purpose of the test, Defense said, "is to be supplemented by data obtained by the Continental Air Defense Command and other interested agencies regarding the effects of atomic explosion at high altitudes."

Use of the atomic warhead was considered as a possibility for ground-to-air weapons such as the army's Nike.

► **Direct Hit Unnecessary**—Because of their great power, the announcement of atomic air defense weapon will greatly increase our ability to repel an

enemy air attack. The employment of such weapons for air defense purposes will enhance the effectiveness of interception aircraft squadrons and ground-based air defense units in stopping enemy bombers short of our cities and other strategic targets."

Major advantage of an atomic air missile at high altitude is that a direct hit is not necessary. Thousands feet and blast of an atomic explosion would disintegrate any plane in the area.

No indication has been given of the size of the atomic missile warhead. Assuming that it can be carried by the Sparrow, for example, it would give that missile power to destroy a whole group of bombers being in formation without endangering the interceptors that launched the missile.

First operational intercepter to be used with the device will be the Nike Ajax, F-98, expected to go into operation at northern outposts in the Alaska and Northeast Air Commands (AWM) Mar 23, p. 10.

Army Nike replacements already have been installed around several domestic targets. So far, the missile has been armed with conventional warheads.

The Defense Department gave assurance that a high blast would not result in dangerous radiation on the ground.

Buying Directive Prohibits Weapons Developers

New protection for the weapons system development contractor is accomplished as a recent Defense Department directive ordering that price advantage alone is not the standard under which proposals containing will be awarded.

The directive No. 4185-23, signed by Defense Secretary Charles E. Wilson, previously was interpreted as justification for a procurement officer to choose a negotiated contract instead of open bidding when such a step will serve the "best interests of the government."

► **No Early Contracting**—Pointing out that such ideas as tanks, radar, guided missiles, aircraft and rockets involve complex development, evaluation and aerial production, the directive says the department must keep strict fire to push the best production deal.

Factors which may have a bearing on this include:

► **The development contractor** can be best equipped to achieve results of his work in serial production because he developed equipment and methods in the process or because it would take substantial time and money to get him

knowledge to another contractor.

► **The development contractor's** knowledge may be essential to continued improvement of the missile.

► **The development contractor** should have the best information in time and money to develop the prototype.

► **Known-How Advantages**—The directive calls for an analysis of all factors before

know-how to another contractor.

► **Production Mode**—Two production plants, powered by Bristol Aeroplane Co.'s Olympus turboprop, are under construction. They are expected to roll out in time for the Society of British Aircraft Constructors' flying display this year at Farnborough.

Postoffice Major, powered by a 1,540-hp Bristol Aeroplane/Siddeley Viper, appeared in the display last year. With the 4,800-hp Bristol Olympus in an afterburner, Polaris's Gnat is expected to reach speeds up to Mach 1.1.

second of the initial production contract and will add.

"Where it is in the government's interest to extend such production to a development contractor, price advantages alone should not be allowed to dictate an award elsewhere, unless a fair and reasonable price cannot be negotiated with the development contractor or unless the price advantage is so substantial as to outweigh the other factors involved."

Industry reaction to the new directive generally was favorable. It was viewed as an effort to protect the development contractor and take full advantage of his know-how, which is difficult to pin on when another firm is chosen for production of a weapons system.

RAF Ordering Glads, Carrier Model Offered

(McGraw-Hill World News)

London—With the Royal Air Force decision to "give the Gnat a try," representatives of the aircraft were before Britain's Ministry of Supply and Warfield Aircraft, Ltd., on how many light-weight fighters to order. Telford claims a development batch of about a dozen aircraft.

RAF's approval of the Gnat comes shortly after Undersecretary for Air George Ward and the Ministry had no interest in the same plane.

Potential customers—RAF's order should help French firms to sell the Gnat to other countries. Two potential customers are the Indian Air Force and Royal Canadian Navy.

W. E. W. Peto, Gnat designer, and Group Capt. S. O. Toller told the India ministry to discuss the fighter (see Folio's) high performance. Gnat does not have a clear field in India because of France's sale to India of the Gnat's only ally in the North Atlantic Treaty organization's light-weight fighter competition.

In Canada, BCLN has received a design study of a converted version of the Gnat. Work also is proceeding on building four such, assuming that would have to be altered about aircraft carrier for the light fighter.

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USAF Seeks More Efficient Management

A double-pronged effort to put U.S. Air Force on an efficient business basis, most advanced of its type in U.S. military industry, is under way at the office of Lt. Gen. Charles H. Stone, III, Deputy Chief of Staff (Comptroller).

The program is patterned after systems used successfully in industry, concentrating on men and money.

► **A financial review** is fixed on every man and company expenditure. It will be used to cut costs and improve budgetary planning.

► **USAF executive development** program is a training course, a series of lectures by both military and civilian business executives, all aimed to the comptroller's problems and financial management. Groups ranging from 50 to 90 key personnel are taking part in the program.

General Stone sees little difference between the professional USAF pilot and other officers who are concerned with management and housekeeping chores of the military enterprise.

► **Planning "What-If" questions**, he believes, "Air Force officers must start being successful in his job, the military commander must know and understand the expected long achievement of the unit to which he is assigned and the standards and objectives for accomplishing it."

► **He feels that the supervisory officer must plan his work just as astutely as the pilot who has out a flight plan and makes sure he will reach his destination with fuel left in the tank.**

He is critical of military business practices in the past, pointing out that the supervisory officer has turned over too slowly, and he has not used an adequate financial management plan.

General Stone points out that total USAF assets are about \$61 billion and inventory is about \$9 billion.

"It is impossible to know what goes on in a business this big," he says, "unless you have financial statements putting a price tag on every item and every service." He can prove that this is possible: the most important part of the Air Force operation.

"Only 4% of our people are actually engaged in duties directly related to living and at that, only 5% of any one time are in combat areas or in combat crew training. The rest of us, 95% are in a support job of one kind or another, and we should somehow account for what we are doing to be sure that we are producing the most and product possible," General Stone said.

► **Operational benefits**—the last issue of the business that can be expected at USAF operating levels.

► **An accurate comprehension** and portrayal of people and things needed to



LT. GEN. STONE

accomplish a mission. That is made possible by reducing the cost of a command organization—the dollar.

► **An accurate measure** of the cost of accomplishing the mission. That is something foreign to traditional military operations.

► **A checklist** that will identify the best production tag the poor producers and show where improvements must be made.

► **Encouragement** at scheduling and programming of work to avoid five peaks and valleys common to most military operations.

► **Cost information** will permit discussion of more resources from support units, to the mission itself.

► **Personnel** and more people to assist in the administrative head.

► **More intelligent personnel**. General Stone feels strongly that the program of putting a price on every

thing a USAF command men and every man in it perform will reduce waste.

► **Budget improvement**—Former military school graduates, General Stone points out, always have emphasized obligations and disbursements. Under the new USAF system stress is put on savings and expense, leaving the second to show who used manpower and supplies and for what purpose.

Under the Financial Management System each USAF base will prepare budget, showing what is on hand and what is needed to do the job.

Adapting the Financial Management System, General Stone says, is a good deal like the conversion to a new weapons system. Personnel officers have been assigned to show how real business methods can be utilized in a military military operation.

► **Educational Program**—First tests were conducted at McDowell AFB, Wash., Lockbourne AFB, Ohio, and Langley AFB, Va. The nation now is being asked to use USAF operations.

Handled with this program to put the Air Force on a professional basis, the comptroller's office is conducting an educational program to improve officer competence.

General Stone believes that the use of other people's money cannot be as treated to managers who had to understand what his office is trying to do to cut expenses and improve efficiency.

Because of the USAF's resources are used at base level, he feels it is vital that the men who are responsible for administration know as much as possible about both USAF and business accounting methods.

Estimate of Aviation Gasoline Consumption 1954-1960

(IN THOUSANDS OF BARRELS PER DAY)

	1954*	1955	1956	1957	1958	1959	1960
U.S. Military Jet Fuel	317	311	280	285	285	285	324
U.S. Military Aviation Gasoline	118	121	129	131	137	135	136
U.S. Civilian Aviation Gasoline	74	75	85	88	92	95	94
Foreign Exports of U.S. Aviation Gasoline	81	82	95	100	102	105	100
Total Military Consumption of All Types of Aviation Fuels	203	196	189	196	192	192	220
Total Consumption of Aviation Gasoline (including Jet Fuel)	275	285	295	305	307	308	320
Total Consumption of Aviation Fuels (all categories)	381	379	367	368	368	367	426

* Actual, unless otherwise indicated. Figures are based on the Department of Defense, Office of the Assistant Secretary of Defense.

Republic, Fairchild Profit Rates Higher

Annual reports for 1954 have been issued by Republic Aviation Corp., Fairchild Engine & Airplane Corp., Texaco Aircraft Corp., and Jack & Heintz, Inc., component manufacturers.

Republic

Republic Aviation Corp., Farmingdale, L. I., New York, report net earnings of \$4,967,523 or 14.5% of \$33,956,681 compared with \$5,184,801 on sales of \$411,931,885 in 1953.

End of the year profits here were credited by President Mendel L. Patai as chiefly responsible for the higher rate of earnings to sales. In 1954 those accounted to 56.71 per cent after a 10% stock dividend granted last December.

At the close of 1954 the company's backlog was \$550 million, down from the previous year's \$1 billion.

Engine Problems—Included in the backlog are unfilled orders for the F-84F, the F-105 and the experimental XF-85. Later plans are raising flight stage along with the XF-84H.

Profits said that 1954 production difficulties with the F-84F were due to problems involving development of the Curtiss-Wright version of the Lycoming jet engine, which resulted in airplanes being held up to the point where production had to be curtailed and 7,000 employees were released. He said major difficulties are passed and operations now are normal.

Other highlights from the Republic report:

- About 424,000 sq. ft. of space will be added in 1955 with acquisition of a Fairchild Engine & Airplane Corp. plant in Farmingdale, N. Y.
- The General Motors Division of Republic has moved from a preliminary design and study phase into research and development activity. Two government contracts were completed in 1954. New contracts dealing with guidance systems and weapons design and analysis are being prepared. New equipment is being installed for production of prototype.

Fairchild

Fairchild Engine & Airplane Corp., Hagerstown, Md., reported net earnings of \$4,134,815 in 1954 compared with \$4,013,561 the previous year. Sales were \$148,458,348, down from \$170,175,266 in 1953.

Other highlights from the report:

- About \$2,700,000 was invested in expanded research and development programs during the year.
- Two new divisions were added—K-

series and Antonov Helicopter Co. Later a concentration on advanced designs with completion of the XH-26 pulse-jet project and winning its contract to develop new turbofan engines. These include a turbofan engine development for application to aircraft and missiles subject to thermal barrier problems and stainless steel housings.

- New phase of the Engine Division at Dear Park, Long Island, will go into operation next fall. It will provide 400,000 sq. ft. of space.

- Production of the C-119 will continue through 1955, planning up to C-123B production scheduled.

- Windtunnel tests will be started soon on a new jet transport design and the prototype may fly by spring of 1957.

- \$1 million expenditure has been authorized for work on boundary layer control.

- Work is progressing on turbine sub-miniature and trials will start this year.

- General Motors Division has added 40% to its personnel and production in current contracts will last into 1956.

- The division has designed a new type of gyrojet motor.

- Unfilled orders at end of 1954 totaled \$246 million, down from \$321 million.

Temco

Record net earnings of \$2,337,249 were reported in 1954 by Temco Aircraft Corp., Dallas, Tex., credited in large part to the company's effective program of consolidation of its divisions.

The year's earnings, equal to \$3.75 a share marked a 10.1% increase over 1953, the previous record year. Gross sales for 1954 were \$39,289,416, compared to \$77,190,918 for 1953. The difference was due, according to President Robert McCulloch, to \$15 million in manufacturing claims in 1953.

While production was devoted in large part to major components for aircraft built by Boeing, Lockheed, McDonnell and Republic, Temco's engineering division was concentrated on a weapons system team. The company expects new strides in the field of electronics, aircraft design and substitutes of new materials.

Jack & Heintz, Inc., Cleveland, Ohio, aircraft component manufacturer, had a net income after taxes of \$3,533,450 in 1954, largest in the company's history except for 1951.

Last year's sales were \$35,361,260, down from the 1953 figure of \$40,118,235. The fact that earnings increased by 27% in the face of this cut in sales was attributed to the end of the excess profits tax.

Jack & Heintz holding at the end of the year was estimated at \$25 million, enough to keep the firm busy for 9 months.

The annual report pointed out that research and development expenditures last year came to \$5,718,000. Because of the nature of modern aircraft components, it is expected that the expenditure will continue in 1955.

"More and more the developments which we must undertake are for highly engineered devices for specific applications in a particular phase or graded altitude, rather than for low speed production having wide application in every engine thrust," the report said.

"This is the nature of the business as it is today and doubtless will be in view of the increasing complexity of the electronic equipment of the new planes. Many of these developments are such that 1 to 5 years are required for their successful completion."

While production was devoted in large part to major components for aircraft built by Boeing, Lockheed, McDonnell and Republic, Temco's engineering division was concentrated on a weapons system team. The company expects new strides in the field of electronics, aircraft design and substitutes of new materials.

Jack & Heintz

Jack & Heintz, Inc., Cleveland, Ohio, aircraft component manufacturer, had a net income after taxes of \$3,533,450 in 1954, largest in the company's history except for 1951.

Last year's sales were \$35,361,260, down from the 1953 figure of \$40,118,235. The fact that earnings increased by 27% in the face of this cut in sales was attributed to the end of the excess profits tax.

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Automatic Carrier Landing

Many more will begin test operational tests on a new landing system capable of landing aircraft aboard carriers for land-off landings.

Developed by Bell Aircraft Corp. (AW Dec 27, p. 46), the Automatic Carrier Landing System has completed tests at a Navy facility under weather conditions that normally would ground fleet aircraft.

Bell says the accuracy of its new test indicates it also could be used as an all-weather landing aid for other military and civil aircraft.

ACLS is a continuous radio-aid system, according to Bell. Radar locates the aircraft and determines its altitude and position relative to the carrier deck.

An electronic computer calculates speed and direction, compares the plane's position with what it should be and transmits the necessary course. This information is fed into a radio transmitter, which directs the aircraft into the right position.

The computer also calculates the speed of the aircraft carrier, its position and pitch and roll at the deck at the instant the plane is 100 yards down.

In the landing approach a wing Bell says, the device will give the plane a wave off and a ground for mother try.

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From Orenda's design, development and production departments came the first all-Canadian jet engine to power the CF-100 and F-86 Sabres V and VI. Expanded research facilities are now under construction to deal with the increasingly complex requirements of the future.

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Because Anatol Ball-Screws move smoothly on steel balls, they provide two additional advantages. They eliminate the need for lubrication, letting you operate in extremely high temperatures without fear of fire, and in extremely low temperatures without problems of sluggish operation. They make possible fast, precise, continuous positioning down to zero-zero tolerance.

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Cleveland Pneumatic Products Now at Work on Aircraft



Flight control actuator used on the Grumman F9F Navy Fighter, outflow of a ball screw driven by a 14-H.P. hydraulic motor, with the out-drive by a 1-H.P. electric motor. Peak operating load is 12,000 lbs.



This ball screw mechanism 28 1/2" long drives and locates the nose wheel on the Grumman F9F Navy Fighter. It operates at thrust loads of 4200 to 5000 pounds.



Designed to be fast but sealed from shock compression, this C-124 landing gear shaft cylinder is installed within an Cleveland Pneumatic 1,000,000 pound capacity, 4,800,000 watt impact working machine.



Titanium is readily machined, drilled, turned, threaded, drilled, tapered—of Cleveland Pneumatic to make the prototype landing gear shaft operator for experimental tests.

Capital Traffic Cure Stirs Fight

Recommendations for relief of the air traffic jam at Washington National Airport, issued by a Presidential Advisory Committee, include use of Bush's Friendship International Airport, but leave the long term problem unsolved.

Last year, President Eisenhower appointed a committee composed of Sen. Lee R. Hughes, Budget Bureau Director; Senator William W. Harrison, Secretary of Commerce; and Harold E. Talbot, Secretary of the Air Force, to make recommendations.

The committee's report finds that:

- The government should expedite studies at National Airport and take other steps to relieve congestion.
- Friendship Airport should be used to supplement National Airport.
- Local citizens should decide on a solution and get together with the air arm and the government for part of financing of the project.

The report also has hope for an immediate permanent solution.

• **Bush Proposes**—The need for a second airport for Washington has long been obvious for a long time. Several years ago, the government started buying land for a field at Burke, Va., south of Washington. Local pressure and a determined campaign by Maryland groups in favor of Friendship just about killed the Burke project.

Use of Friendship has been a sore point in the controversy. Maryland congressional leaders feel that the field is close enough to be feasible in an alternate terminal. Local groups and the airlines don't think so, and strong objections to the committee arose.

Ashton had Washington, it is a large extent, a short-hand solution. Then before the vote was announced in getting to the Baltimore airport will denote the advantage of flying.

• **Battle Aids**—Airlines-Maryland leaders say that long-term traffic could be diverted to Friendship with little trouble since passengers on such flights are not particularly concerned with a little added travel time.

Sen. John M. Butler has asked the Civil Aeronautics Board to take formal action to designate Baltimore as alternate terminal for Washington.

Friendship Airport never has operated at anything close to capacity. It is considered a model field here in operational standpoint, unless subject that it simply isn't convenient enough to serve Washington.

• **Handsome, Not Cheap**—The committee recommends that local groups get together with the airlines and the government in constructing a new Washington airport is viewed in the

capital as more of a headache than a help. The project would involve agreement between Virginia, Maryland and the District of Columbia on site, financing and other factors. Possibly the only agreement is considered feasible.

According to the committee, the airport should be located "in the same manner as in all other civilian airport construction in the continental United States—i.e., by the affected communities and the air transport industry." Special factors in the Washington situation complicate this concept.

The District of Columbia has no vote, and thus little opportunity to express its opinion and make its wishes felt. Any funds to be spent by the D. C. government must be approved by Congress. So the District of Columbia isn't able to manage its affairs and local airports independently as other municipalities.

• **Lack of Funds**—The cost of the airport project appears to be that there are currently no federal funds available to build a second Washington airport. The situation offered will be helped, but they don't touch on the basic issue of where and when the second airport will be built.

Various steps are recommended for relief of the congestion at National Airport. A request for funds is being drawn up, and, if Congress approves it, work might get under way this summer.

The report asks for expansion of gate positions, parking, baggage handling facilities and other facilities, an increase of runway and taxiway lighting and an additional hangar.

Other recommendations by National:

- Advise operations at neighboring Ronald Reagan Washington National Airport to relieve airport conditions during heavy weather.
- Relieve National of all government traffic but that of the highest rank and urgency.
- Develop language plans to determine the feasibility of absorbing all Boeing and American activities.
- Designate a high density control zone in the Washington terminal area.
- Improve cooperation of all aircraft lessors of government with civil aviation in every way possible without impairment of essential military and civil government operations.

New Ford Tri-Motor Nearing Completion

Elkhart, Ind., Codd-Whitely of a new Ford Tri-Motor is nearing completion of the Tri-Motor Aircraft Corp. expected here to build a new version of the 79-year-old all-metal transport. The new model will be called the Stout Tri-Motor.

Designs show the plane, intended for both passenger operation, will have shorter takeoff and landing distance, faster climbing rate and suggest payload per gross weight of any transport plane.

• **Flight Transport**—Formation of the

Military Aviation Obligations

Contract cancellations for aircraft and related government exceeded new orders placed January with the result that three military services had over \$120 million more on hand in unobligated funds at the end of the month than at the beginning.

NET OBLIGATIONS (In Thousands)

	January Obligations	Unobligated Balance Feb. 1
Aircraft		
Air Force	32,496	53,193,560
Navy	—145,097	1,285,479
Air Force	—1,925	116,041
Total	—112,526	54,601,081
Related Machines		
Air Force	185,177	478,835
Navy	16,656	115,190
Air Force	31,523	340,015
Total	233,356	718,645

Electronics and Communication Equipment

Air Force	79,654	673,575
Navy	2,936	96,864
Air Force	3,941	142,179
Total	36,531	912,618

company followed an announcement in December 1946 of plans to revive production of the Tri-Motor (AWW Dec. 28, 1953; May 27, 1954, p. 18), first introduced in 1928.

Tri-Motor components include designer William B. Stout and Robert E. Heyden, president of the new firm. The corporation plans to raise public stock.

"The 1955 version will be a single-passenger freight airplane for high lift, short takeoff and landing, and without any more gadgets than are necessary for contact flying in underdeveloped regions . . ." Stout says.

The fundamental purpose of this

type of plane is to speed up distribution and carrying capacity, with the first price to the customer kept to an absolute minimum. No such delay as today except some of the (30) old Fords still in the air."

►Tri-Motor Changes—The Stout-Bushmaster has been designed to use minimum loading and with only a small maintenance and equipment as necessary for contact flying. All extras will be optional, including those for equipping it as a seaplane.

The principal changes in the new version include widening of the fuselage by 18 in., more powerful and lighter engines, possibly Pratt & Whitney

Ray R555s with cooling for better engine temperature control, moderation of cockpit, addition of wing flaps, installation of hydraulic struts on the landing gear, mounting of control cables externally, transfer of engine instruments to the pilot's panel, addition of a large cargo door, strengthening of floor for concentrated loads, and expanded vertical tail.

With these changes, the company says its transport will have a gross weight of 11,500 lb and be able to lift a payload of 5,500 lb. It will have a range of 525 mi., a cruise speed of 125 mph, and a stalling speed of 40 mph.

Climb performance at sea level will be 2,000 fpm.

MATS Chief Reports On Turboprop Trials

The first 150 hr. of experimental operation of Military Air Transport Service's two turboprop Cessna YC-119C transports has uncovered a number of vibration and engine problems.

Lt. Gen. Joseph Smith, MATS commander, recently told the Wings Club in New York that the planes are given periodic drop tests to discover incipient cracks and failures. The oil tanks have been remade of heavier gauge metal to reduce cracking.

►Engine Knock—The planes, each powered by two Allison YT56s, have experienced rough starts. The only fix for this condition is to shut down and restart.

MATS is now negotiating with the Air Staff for 12 production units of the Y56, on which Smith expects roughness will be eliminated. MATS has eight YT56s at present.

Unintentional loss of Cessna by MATS' turboprop program test squadron, based at Kelly AFB, Tex., is a loss 2 hr. a day, compared with MATS' Beechcraft utilization of 4 hr. This loss is reported by the 149th, owing to the engine and the engine's ability to inspect and overhaul the engines—it takes 90 days at present.

Only one serious YC-119C incident has occurred thus far. Being in the air while engine failed on a low-level landing, Temporary No. 6, Removal of the air stream. The two Cessnas are not suitable ships. Air intake screens are not located as removable. No provision is made for wing or prop icing. They will be as equipped by tail, and Gen. Smith.

The planes are flown at 25-25,000 ft., rather than optimum altitude of 30,000 ft., because of performance limits. Operated at 250 knots true airspeed, they have shown a consumption of 156 gal./hr. at 50% power.

The turboprop squadron is training



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completely eliminates all these problems. The "Clip-Type" socket will not accept any over-stress probe or pin, nor can it be forced into it. Also, no amount of soldering or twisting of an acceptable pin or probe can possibly damage the spring clip. This new socket is now standard in all Bendix construction including those using solderless, high-temperature and thermoplastic contacts.

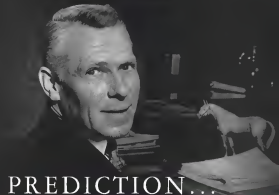
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test pattern, route now, one between Kelly and Travis AFB, Calif., the other between Kelly and Andrews AFB, Md. Squadron has 21 officers and 168 men.

► **New Ship-Sumit** expects that Douglas has now taken on 70-yr old Phase I testing with the YC-124B, and the plane should soon be ready for Phase II.

In December, MATS hopes to get its two Lockheed YC-123 Super Cubs and two Boeing YC-97s, each powered by four Pratt & Whitney T74 turbo-prop engines. Smith expects the service to gain valuable experience with the turboprops, against the day that the Douglas C-119 turboprop transport comes into service. For cargo transport, Smith favors the turboprop powerplant, but he views the possibility of the aircraft for both roles. For passenger service, he favors the jet transport.

► **Reactivation—MATS'** reactivation and not cross program has been moving in high gear for the last year and will continue for the next 18 months. Eighteen transport squadrons have been reactivated or converted since the program began and 168 heavy transports have been absorbed in the 1,359 plane fleet.

Since the move of headquarters to McCarran AFB, N. J. from Westover AFB, MATS has concentrated at the new headquarters probably the largest fleet of one-seat transports ever assembled at one location.

CAB to Air Inspection Proposal at Meeting

Civil Aeronautics Board's proposed elimination of visual inspection of general aircraft will be explored further at a public meeting in Washington Apr. 13. The Board's purpose in considering the regulation is to place more responsibility on industry for the continued airworthiness of each aircraft.

CAB said its action in setting up a meeting under the Bureau of Safety Regulation is in response to numerous requests for a public discussion of planned changes in procedure. After the proposal was announced Dec. 30 general aviation operators indicated acceptance of the Board's objective but asked opportunity to express requirements.

As a consequence, CAB suggested the open meeting be limited to discussion in the areas of disagreement, which include:

- **Periodic inspection** The mandatory 100-hr inspection proposal may be made more flexible. An alternative would be periodic inspection at times consistent with type of operation but with a maximum of one annual.
- **Progressive inspection** Restriction of progressive inspection to certificated repair stations could be lifted. An alternate proposal would be to permit progressive inspection elsewhere.

► **Mechanics' proficiency** Proposed regulation would require an authorized mechanic to make a minimum of two aircraft inspections a month. Other means will be discussed to assure a mechanic's continuing proficiency.

Colombia Civil Fleet Up 30% in Year

(McGraw-Hill World News)

Bojotas—The number of commercial planes registered in Colombia for the end of 1974 had increased 30% to 386, from 297 in registration of 200.

Despite these additional transports,

cargo requirements in December were so heavy Avianca had to charter two Paa American DC-4s during the month. The Civil Aeronautics Board of Colombia has already authorized the import of 48 more planes.

Other new developments:

- **Lloyd Aereo Colombiano**, a new airline, started operations Dec. 30.
- **First commercial helicopter company** in Colombia started operations. Totali can, Bell Co.
- **Extensive pilot training program** is being started by the Civil Aeronautics Board. Order is 52,000 a pilot.
- **Training school** for cockpit pilots and gliders will be opened this year.

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Bell Aims Copter at Ore Hunters



UTILITY COPTER is being used by Bell to test out automatic landing techniques.

To prove the business value of its utility helicopter as a tool for exploring, wilderness areas protection and to expand its market, Bell Aircraft Corp. has established the Bell Exploration and Development Corp. The new subsidiary will:

- Field test a variety of air transport mechanical and scientific equipment used in modern uranium exploration
- Develop, evaluate and integrate new refinements concerned during actual operations that will maximize the effectiveness of the latest Model 47 design.

Bell is paying the costs of proving this helicopter equipment team because the firm believes that such research is often paid beyond the reach of individual potential customers and the main aircraft manufacturer cannot afford the cost to develop his markets.

Harvey Corbett, vice president of the parent company's Helicopter Division, is president and Arthur E. Foran is general manager of the new group. Offices are at Ft. Worth, Tex., and Glendale, Calif.

"We are field-testing the helicopter and special equipment installation in order to determine exactly what is needed by the fast growing uranium industry," Corbett explains. "Based on our experiences in the field," he states, "we will be able to determine and produce a helicopter of unlimited utility for uranium prospecting and production and for the many commercial helicopter operators using our machines."

► **Discontinues Teas-**The Bell subsidiary has a Standard Model 47C, fitted with a variety of mining and pro-

pecting devices, testing the Southwest. The package display includes a 193-lb. accelerometer for measuring and recording radioactivity emanating from the earth. A 100-lb. diamond core drill is carried, dismountable on the copter's dual landing gear cross tubes.

A large level of company-owned and chartered fixed-wing lightplanes has been active in prospecting in the Southwest since the early days of the "Uranium Rush," which has diminished as demand for the critical mineral increased.

Helicopters are also active in this area. Anascooda Copper Mining Co., a recent uranium producer and a 47C user, credits aerial surveys with the discovery of its main production ore field in New Mexico. Bell states.

Field geologists have cut one and



PROSPECTOR checks instruments graph reading after eight-hour survey flight.

two-day surface trips to drill a day, using copters. Important tree samples and vegetation readings can be checked at field offices within hours and appropriate action taken quickly. Also, the copter can get men and materials quickly to otherwise inaccessible spots.

► **Repeat Ventures-**Bell previously had organized a subsidiary to prove the value of the helicopter in business and develop a potential market. One was organized to study the copter's performance in petroleum geological surveys shortly after the model 47 received its Type Certificate in 1946.

After selling the petroleum industry on the copter, the company dissolved the subsidiary. There are now reports that a dozen helicopter charter operators leasing Bell machines to oil companies all over the world and two oil companies also own 47Cs, the firm says.

Automatic Off-Course Navaid for Learstar

First business plane to incorporate an automatic off-course navigation system into its autopilot has been sold by Lear Aircraft Engineering Division to British American Oil Co., Ltd., Toronto, Canada. The installation is also the first purchased by any commercial operator.

The new integrated Collins Radio NC-104 off-course computer and Lear L-5 autopilot enables the Learstar to fly from automatically to any off-course destination at any point within range of two VOR stations. System also provides the crew with information as the distance to the destination or waypoint without need for DME equipment.

Added feature of the Collins system is a search-and-capture which automatically tunes the VOR receiver to selected stations on route and sets in required data in the navigation computer (AW Dec. 15, 1957, p. 41).

Certified in the airline transport category, the Learstar is a seven-seater fixed Lockheed Lodestar, seating up to 12 passengers plus a crew of two. Lear reports that vehicles call for two de Havilland aircraft. Among those who have placed orders are: Canadian Vought Aircraft, Inc.; Johnson & Johnson; Burroughs Corp.; and Charles B. Wright, Inc.

Lightplane Exports

February exports of U. S. civil planes weighing 4,000 lb. and less totaled 41 units valued at \$181,571, Aircraft Industries Asia, reported recently.

The latest total brings to 96 the number of planes exported in the first two months of 1955. Value of these shipments was \$845,990.

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SEC Reports Aviation Stock Deals

Disposal of 10,000 common shares of Bellanca Aircraft Corp. stock by G. M. Bellanca, a director, leaving a holding of 600 shares, is reported in Security and Exchange Commission's latest transaction summary.

Other transactions reported for the last January to end February period: Aero Supply Manufacturing Co. Disposal of 1,000 common shares by Henry Meyers, director, leaving a holding of 16,500 shares.

Albino Airlines Acquisition of 1,500 common shares by Frank C. LaCasse, director making a holding of 5,400.

American Airlines Acquisition of 100 common shares by J. W. Parley, director, making a total holding of 300, and these acquisitions through exercises of options: 180 common shares by W. Nelson Sharp, officer, making a holding of 1,900; 1,750 common shares, total holding, by George C. Van Nieuwen, officer, and 1,000 common shares by Marvin Whitlock, officer, making a total holding of 2,500.

Bell Aircraft Corp. Disposal of 5,500 common shares by Ray F. Whitman, officer and director, making a total holding of 11,000.

Bellanca Aircraft Corp. Acquisition of 800 common shares by W. H. Hough too, officer, making a holding of 3,175.

Bonair Aircraft. Acquisition of 1,000 common shares by Wilbur Balch, director, making a holding of 64,805 acquisition of 900 common shares by Eugene C. Eppley, director, making a holding of 6,500; disposal of 1,800 common shares by Thomas F. Ryan III, director, leaving a holding of 41,593.

Capital Aircraft. Acquisition of 500 common shares through exercise of an option by Raymond G. Lechiel, officer, making a holding of 6,211, acquisition of 511,603 debentures by James W. Austin, officer, making a holding of 514,000.

Cessna Aircraft Co. Disposal of 1,500 common shares by Dennis L. Wallace, president, leaving a holding of 65,550.

Colonial Aircraft. Disposal of 500 common shares by Joseph Sturdivant, director, leaving a holding of 1,000.

Eastern Air Lines. Acquisition of 100 common shares by Charles French, officer, making a holding of 1,215, acquisition of 200 common shares by Stevenson Peabody Jr., director, making a holding of 590.

Empire Electric Manufacturing Co. Acquisition of 1,500 common shares by M. H. Inc. beneficial owner, making a holding of 16,750.

Finchfield Engine and Airplane Corp. Acquisition of 100 common shares by A. F. Flood, officer and director, making a holding of 1,350.

Flying Tiger Line. Acquisition of 53,000 debentures by Robert Pascoe, officer and director, making a holding of 513,000.

B. F. Goodrich Co. Disposal of 2,600 common shares by John L. Coll, Jr., director, leaving a holding of 44,100; disposal of 250 common shares by H. V. Carstairs, officer, leaving a holding of 4,950; disposal of 400 common shares by E. A. Stevens, officer, leaving a holding of 4,900.

Goodyear Tire and Rubber. Acquisition through exercise of option of 5,500 common shares by H. E. Hinde, officer and director, making a holding of 9,482; disposal of 3,000 common by F. E. H. Lewis, officer and director, leaving a holding of 31,000.

Lockheed Aircraft Corp. Disposal of 172 capital shares by Charles A. Barker Jr., director, leaving a holding of 1,800; disposal of 1,800 capital shares by H. B. Campbell, officer, leaving a holding of 1,850; disposal of 800 capital shares by Bert C. Mossman, officer, leaving a holding of 250.

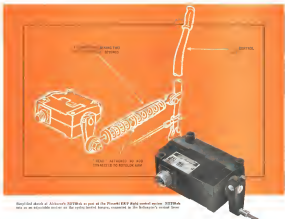
Glenn L. Martin Co. Disposal of 7,800 common shares by Glenn L. Martin, director, leaving a holding of 291,075; disposal of 900 common shares estate of Duncan M. Spence, director, leaving a holding of 1,500.

Norwalk-Hempstead Regulate



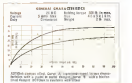
Copter Carries Own Dolly

Cost Guard field HEL runs down onto a new portable dolly, weighing only 40 lbs., designed to handle helicopters or planes whose such facilities are not available. The rig quickly disassembles into five sections which are carried by the copter. The copter loads the crew members the dolly and then flies the unit onto the desired ground transportation. It was developed at USG's Research, N. Y., Air Station, which will fit all of its foot-operated system with the portable platform.



HOW WE TOOK THE KICK FROM THE HUP'S STICK

In ROTOLok, we pioneered a simple, compact geared magnetic brake that simultaneously held position and relieved load on the HUP's control lever. But the problem of "kick," due to undamped hinge springs, remained. Here's how we licked it: We designed a centrifugal friction damper, and incorporated it in the ROTOLok units. This added feature of Airborne's ROTOLok might well solve a similar problem in the design of your control system. Write us for details.



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CANNON ELECTRIC

Co. Acquisition of 1,500 common shares by H. F. Dwyer, officer, making a holding of 2,000. Disposal of 600 common shares, total holding, by Charles B. Swartz, officer and director.

Northwest Airlines. Acquisition of 300 common shares by Marion H. Fry, director, making a holding of 500. Acquisition of 1,000 common shares, total holding, by Alvaro Pereira, director, acquisition of 400 common shares by Whitlock Whitney through Whitney Securities Co., making a holding of 1,500.

Northrup Aircraft. Disposal of 11,600 common shares by William B. Collins, director, leaving a holding of 6,400. Disposal of 5,600 common shares by John W. Myers, officer and director, leaving a holding of 3,600. Acquisition of 200 common shares by John O'Malley, director, making a holding of 321. Disposal of 1,900 common shares by R. J. Zipes, officer and director, making a holding of 1,431.

Pacific Northwest Airlines. Acquisition and disposal of 200 common shares by M. E. Diamond, officer, making a holding of 28,713. Acquisition of 390 common shares by M. B. Kirkpatrick, director, making a holding of 2,000. Acquisition of 1,500 common shares by Harold A. Olsen, officer, making a holding of 7,600. Disposal of 500 common shares, total holding, by Paul Penick, director.

Pan American World Airways. Acquisition of 200 common shares at compensation and disposal of 473 shares by Alvin P. Adams, officer, making a holding of 100, and these acquisitions at compensation, 112 common by Henry H. Berlin, officer, making a holding of 1,005, 171 common by R. G. Ferguson, officer, making a holding of 995, 266 by Franklin Gluff, officer and director, making a holding of 1,752, 266 common by Walter E. Mannum, officer, making a holding of 10,360, 171 common by Clarence M. Young, officer, making a holding of 901.

Pitney Corp. Disposal of 1,000 common shares by Thomas A. Kennedy, officer and director, leaving a holding of 10,030.

Radio Corporation of America. Acquisition of 100 common shares, total holding, by Walter Rudolf Smith, director.

Ryanair Manufacturing Co. Disposal of 520 common shares by Carl J. Gilbert, director, leaving a holding of 1,000. Acquisition of 2,280 common shares by Perry L. Spencer, officer, making a holding of 2,500. Disposal of 165 preferred shares, total holding, by Paul F. Harrah, officer.

Reynolds Metals Co. Acquisition of 381 common shares by Calvin E. Campbell, officer, making a holding of 1,540. **Rhodes Manufacturing Co.** Disposal of 700 common shares by L. W. Bonta, of-

ficer, leaving a holding of 300. Disposal of 7,100 common shares by J. L. Rhoads, officer and director, leaving a holding of 90,000. Disposal of 900 common shares by J. B. West, officer, leaving a holding of 10.

Seaboard and Western Airlines. Disposal of 500 common shares by Douglas M. Anderson, director, leaving a holding of 6,918. Disposal of 1,800 partly held common shares by Wallace P. North, officer and director, leaving 27,249 partly held shares, disposal of 2,500 common shares by Arthur V. Noodin, officer and director, leaving a holding of 20,121.

Solar Aircraft Co. Acquisition of 200 common shares, total holding, by Herbert F. Shady, officer and director. **Sperry Corp.** Disposal of 1,000 common shares by Thomas R. Dyer, director, leaving a holding of 6,800. Acquisition of 5,000 common shares by Preston K. Bussert, officer, making a holding of 13,272. Disposal of 100 and acquisition of 50 common shares by Lindsay Hopkins, director, making a holding of 14,350. Disposal of 7,300 common shares by H. T. Vickers, officer, leaving a holding of 38,800.

United Air Lines. Disposal of 100 common shares by R. W. Ireland, officer, leaving a holding of 460.

United Aircraft Corp. Disposal of 500 common shares by H. Merrill Horner, president and director, leaving a holding of 1,000. Disposal of 300 common shares by William B. Hubbard, officer and director, leaving a holding of 2,500.

Western Air Lines. Acquisition of 1,000 equal shares through exercise of an option by Yarnal C. Lindholm, officer and director, making a total holding of 2,000.



PAA Streamlines DC-3

New men wheel well doors on the Douglas DC-3 increase the plane's cruise speed 20 mph. Pan American World Airways reports. Actuation is automatic in cooperation with extension of main landing gear. Extension cycle is 7.11 sec., completed with 23 sec. for the standard gear. Doors add 10 lb. to plane's weight. Modification was made at PAA's Brownsville, Tex., base.

Moving the conference table 800 miles

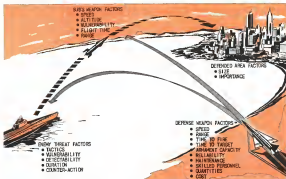


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PRIME FACTORS in hypothetical weapon system involving defense against missile-borne or plane-carried submarine. Definition among these factors determines choice of preferred weapon system. Neglect of any essential factor will result in ineffective system.

How an Air Weapon System Is Evolved

By Irving Stone

Henceforth, **Crit-Not** too long ago aerial weapons evolved from a lot of specific requirements. The military called out almost everything—speed, ceiling, range, engine, armament, details down even to the type of gunight.

Today the approach is just about reversed—only a broad generality needs the beginning of a weapon system. A general defense problem may be projected; the specifics evolve as the solution.

The difference is complexity and of fact between these two approaches is tremendous.

Today's job boils the workload for aerial analysis, attack, and defense when the best engineering brain. Not only is defense whole cooked, but all ground support material as well.

Operational tests have become extremely short, equipment configuration a staggering, small error can be catastrophic. Keying the capabilities of the various components is a gigantic task.

All this points to the need for top analytical groups. One example of such a group is Northrop Aircraft, Inc.'s Weapon System Analysis Dept.

(WSAD), headed by Herbert K. Weiss and his assistant, Ward B. Dornan. Typical Problem—Take this general, hypothetical problem:

Defend a one-faceted U.S. target against attack by submarines or weapons (perhaps missiles, rockets or small armed aircraft) carried by them.

Here is how a group like Northrop's WSAD would proceed:

First, determine the characteristics of the targets which must be defended, the manner in which they affect enemy tactics, and the way these tactics are limited by the characteristics of the submarine.

Weapons which could be used to attack the submarines are then to be considered.

This develops the problem of detecting and locating the U-boats and directing the defense weapons system (and modified as the stage of the thinking) to the proposed submarine.

► **Final Attack Choice**—At this stage of solution development, periods of time needed are considered. Time between alert and completion of enemy mission are examined and the type of defense weapon determined to meet this time requirement, a controlling factor.

► **If time involved is moderate**, the design requirements for the defense weapons may yield a high performance, but expensive, anti-submarine aircraft.

► **If time requirement is severe**—not extremely so—it may be satisfied by a responsive natural aircraft.

► **As time becomes more critical**, the possibilities of a defensive missile, possibly with a portion of its trajectory underwater, may be examined.

► **When 30 sec. to 1 min.** is the order of the available time, increasing emphasis

is put thought on going to accomplish the destruction of the submarine's weapon after it has been launched, since the cost of launching a system to attack the submarine directly might be greater than the cost of destroying its projected weapons, whether it be tank rocket or mine-arming plane.

On all these cases the study would be preceded with an examination of existing and planned weapon systems which the study under analysis would replace. Thus, it might even be concluded that the best weapon system obtained from the new analysis would not provide a sufficient increase in defense to justify the expenditure of funds required for its development. However, it might be indicated that the existing weapon system is at a critical point and that improvements to it might be profitably explored.

► **Preliminary Design Entry**—The next indicated the general type of weapon system that could satisfy the conditions of defense, next step is to determine the specific design characteristics of the system components.

Here, the major portion of the design analysis would be done by Northrop's Preliminary Design Group with the assistance of specialized departments such as Guidance, Flight Controls and Sensor Mechanisms, Fluid Dynamics Structures.

It is important here to know when company's capabilities end and to call in a specialist outside with particular knowledge in a specific field.

In the transfer of responsibility from WSAD to Preliminary Design the former recommends design objectives such as the missile's or plane's range requirement, payload, weather capability, altitude, speed, time to launch or to be in defense, altitude, condition of completion in specified period, or in case of a missile, whether continuous power would have to be supplied or whether power could be turned on upon receipt of the alert signal.

These objectives are presented to the former Design for detailed definition of the weapon system configuration.

► **Follow-Up Role**—At this point Northrop's WSAD becomes a secondary force team, taking on a follow-up role in preliminary design and increasing their, even as far along as the production stage.

In its follow-up role, WSAD assists the program of design from the viewpoint of the complete weapon system concept, to assure that design alternatives are selected on the basis of projected effectiveness.

► **Example**—The terminal phase in the attack on the submarine. Should it be a high-altitude approach with a sharp terminal dive or a low-altitude approach?

The high-altitude approach might give a more accurate delivery system,

but retrieval means vulnerability to the submarine's defense. The low-altitude approach might be less accurate but the weapon need against the submarine might be more difficult to detect.

This points up one consideration which would have to be studied.

Suddenly, there can be many other alternate choices which would have to be considered carefully. At last back some of the factors now appear more important than others, but in relation to the overall problem, each is a key consideration, requiring as much analysis as any other.

► **Programming Plan**—A final function of WSAD is to support new proposals made by Northrop in response to military service request, and proposals generated within departments such as the primary Design.

In this role, WSAD acts as a programming procedure which establishes a complete weapon system development plan. This program integrates

- Aircraft or missile development timetable.
- Ground-support equipment.
- Flight testing.
- Training.

This means that the complete item will be developed in accordance with the plan, so no single component will delay an particular phase.

For instance, training is scheduled to satisfy the training program with adequate prepared crews, so that the test program will proceed according to plan. On the programming plan (see reverse) that a particular piece of ground support equipment, such as a test area, is available when needed. De it was determined the number of aircraft, missiles, or units of ground support equipment which will be required for the entire testing and subsequent test lower testing.

After in the form of a series of aircraft or weapon system design development and operation.)



TYPICAL CHOICE to be resolved in system definition is between high-altitude, high accuracy, low survival probability, trajectory, or low-altitude, low accuracy, but low-detectable trajectory.



THE CHART illustrates the main parts of a weapon system which must be coordinated in the overall development plan. Any item which is not brought about properly can jeopardize the entire plan.



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Defense Dept. Opens Titanium Laboratory

A titanium metallurgical laboratory to provide a source of detailed technical advice needed by government contractors and their suppliers has been established by the Department of Defense under contract with Battelle Memorial Institute, Columbus, Ohio. The move was announced by Donald A. Sparks, Assistant Secretary of Defense (Research & Development).

The facility will gather and disseminate information and supply advice on production and application of titanium in military equipment. The laboratory will also meet and advise the Research and Development Coordinating Committee on Materials of the Defense Department in respect of its titanium program.

It will also aid government agencies and contractors in developing data needed for preparing specifications for titanium metal and cast products, and handle short range laboratory investigations to determine titanium difficulties.

The project will supplement existing customer service services that are provided by industry and government laboratories.



Meet 'Sierra Sam'

Two Remanance "Sierra Sam" have been added to the family of "Sierra Sam" (Sierra) turbo-propellers, turbo-propellers, diesel and gas turbine engines. Two Models 157 and 160 turbopropellers incorporate new and weight distribution of a six-foot 200 lb. case, have construction and detail for fitting right gear. Models can receive accessories but otherwise for sale to 1600. Company also maintains factory repair service, parts inventory and staff of application engineers. Moler-Sears Engineering Co., 115 E. Main Street, Suite 100, Madison, Calif.



Famed for its combat superiority with the United Nations in the skies over Korea, the Sabre Jet is now being supplied to other NATO countries.

Twin Coach Aircraft Division was selected as a subcontractor for large and intricate assemblies for the F-86 as well as for North American Aviation's other high-performance aircraft, the F-100 and F-104.

These important assignments are typical of the way in which leading aerospace manufacturers rely on Twin Coach as a source of major aerospace assemblies.

If you have an assembly you're considering subcontracting, call Twin Coach for consultation. Our current experience... our 25½ acres of plant and facilities are at your disposal.



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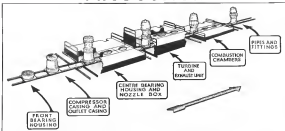
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AN 100



MOVING LINE has raised platforms at some stations to give easy access to upper portions of vertically assembled Avon turbojets.

Roll-Royce Uses New Assembly Line

(By Cecil Reid, World News)

London—Roll-Royce has gone to a multiple moving assembly line for producing Avon turbojet engines at its new plant at East Kilbride, Scotland.

Initially employed in a temporary manner, pending completion of the factory and another type of installation, the new layout proved so efficient that it has been retained as a permanent production scheme.

This moving assembly line method contrasts with the static, impromptu system used at Rolls' main plant at Derby, England, where engines are assembled on hydraulic lifts by means of overhead cranes which can perform any task.

These vertical hydraulic lifts, embedded in the factory floor, were to be the final installation of the new plant. Instead, each workman at East Kilbride, in typical assembly-line style, now performs a small number of highly specialized operations. The expensive hydraulic lifts are employed only in the engine test area where they are used for workman safety.

Definite Advantages—Roll-Royce officials cite these advantages of the assembly line vs. the hydraulic lift method of jet engine assembly:

- Less lost motion in handling materials.
- Fewer workers needed per unit of capacity.
- Less time required to train workers.
- Simple, low-cost construction and easy maintenance.

- Great flexibility in production capacity.
- Low capital investment.
- Negligible maintenance ("a little paint over three years").
- Great mobility—easy to move in case of plant relocation.
- Easily adaptable to different size engines.

Possible Disadvantage—One possible disadvantage of the assembly line system, feared by Roll-Royce technicians, is that it may be difficult to handle engine modifications quickly.

In an emergency, ability to make modifications quickly may be of vital importance. Thus, as an example, during World War II it became essential to add 5 mph to the top speed of the Spitfire to enable it to catch the V-1 flying bombs. Roll-Royce assembly lines, trained in all operations of the Spitfire's Merlin engine construction, were able to begin turning out more powerful powerplants within hours.

Nevertheless, Derby is pleased with the lower cost of operation of its latest factory, and any new jet engine built rolls out as well probably using the assembly line technique.

What Is It?—The line consists of a 65 ft long track made up of metal "U" beams set on their sides and joined to the factory floor. Several work stations are arranged along either side of the track.

Some of the stations are raised above the floor to facilitate work to be done at particular stages. The raised flooring

at these stations is tailored to fit around the engine precisely and hangs up to allow the engine to pass through the stations.

The engine starts at one end of the line on a specially built mounting bar attached to a four-wheeled dolly. The engine, on its dolly, is pushed by hand from station to station, where the various engine parts and components are fed in.

The engine then goes vertically as they move down the assembly line and emerge from the far end as completed units.

Each stage is provided with a turntable which allows the engine to be oriented all of the main production line as well as requires modification or other specialized work. In case of emergency, the engine could be used as a different assembly station.

How It Works—Here is how Roll-Royce has organized the jobs to be performed at each station:

- **First stage** of the assembly line has two work stations to install the front bearing housing and air intake.
- **Second stage** has three stations to add compressor rotor and compressor casing, including rotor blades.
- **Third stage** (first raised stage) has three stations to install compressor outlet casing, rear bearing housing, and auxiliary drive section.
- **Fourth stage** is the highest and has three work stations for assembling the nozzle box, turbine, auxiliary piping and fuel system units.



FINISHING OPERATIONS are carried out on Avon turbojet engine.



CONVEYER TRUCKS load parts from sub-assembly to main line.



TURNTABLE allows Avon to be oriented off the special work.



COMBUSTION chamber is fitted to Avon jet.

- **Fifth stage** is where combustion equipment is added—burner tubes, combustion chambers, etc.
- **Sixth stage** is for finishing operations, such as the installation of various accessories, etc.

The assembly line can easily handle a work load equivalent to the production capacity of 12 hydraulic lifts.

Specific Savings—Some of the specific savings attributed to the assembly-line production system as compared to the hydraulic lift method are:

- **Material handling** is reduced—it is more efficient to convey parts and components directly from sub-assembly lines to points where they are needed on the main assembly line than it is to carry all parts and components to many lift sites. This economy alone saves approximately \$11,000 a year.



MACHINE SHOP LAYOUT at Roll-Royce new Avon jet factory in East Kilbride, Scotland.



Here's the inside story on Du Pont Aircraft Rivets

Q. What are Du Pont Aircraft Rivets?

A. They're strong, one-piece fasteners resembling mild rivets, but without the pointed ends or an anvil used in a hot, manual operation. They change shape while some the length of the shaft (see left photo, above).

Q. How do they work?

A. You simply drill hole, insert Air Lock Rivet, apply heated riveting iron. Rivet expands . . . forms heat-like shape and . . . completely fills hole in as little as 1/4 second (photo at right).

Q. How fast can you set 'em?

A. Up to 200 rivets in 10 min, hand or machine. No heat, no gas, no fumes, no noise. No pneumatic hammer, backing bar or other equipment, either—you work only from hand tool. It's a one-man, one-tool job!

Q. What about pressure and secondary applications?

A. Aircraft Rivets are designed to handle both. For example, one leading manufacturer uses them in the U-shaped channel member to enclose assembly; another, to attach skin to wing.

Q. What are they made of—what sizes available?

A. You can obtain Aircraft Rivets in 17S-2 or mild steel or aluminum alloy. Components to Military Spec. MIL-R-7800, in 1/8", 3/16", 1/4", 5/16" and 3/4" diameters. Nickel rivets, also widely used in military aircraft and missiles, are available in the first three sizes. You choose of regular or blind rivets. Rivets—1/2" or 3/4" diameters.

Q. Do they require refrigeration?

A. Absolutely not.

Q. Are there any special types rivets?

A. Though standard Aircraft Rivets will meet most requirements, there are types for specialized applications. These include a new High-Temperature Rivet, now used in jet engines and missile structural parts, which retains its strength at 1400°F.—and a blind-free lanceproof Rivet.

ANY QUESTIONS?



You'll find answers to them all in the new 20-page booklet, 40 pages, 12 diagrams, 100 questions and answers. It's the complete story. You'll see how Du Pont Aircraft Rivets expand blind and work under heat—no heat, no gas, no fumes, no noise. And the solution to a tough assembly or repair job. For your free copy write: E. I. du Pont de Nemours & Co. (Inc.), 11102-A Newmarket Blvd., Wilmington, DE, Delaware.

the equivalent of 1000 rivets, requires 24 lifts plus two helpers. Twelve hydraulic lifts would separate six helpers with the 24 lifts, another saving.

• Most important, it takes six to nine months to train a fitter to assemble a jet engine on hydraulic lifts since he must know every detail of assembling a jet engine. And it takes another six months for him to reach maximum efficiency. On the assembly line, where each fitter needs know only one or two operations, training time is four weeks, perfection time another four weeks.

• Hydraulic lifts require frequent maintenance in the plant's shop, a comparison to supply hydraulic power and heavy overhead traveling cranes for each lift site to haul away completed engines. The assembly line requires only skids, 4-in. increments in the factory floor to locate bearings, heavy crane facilities are required only at the end of the line. Light cranes are adequate to lift heavy components into position at appropriate work stations.

• Further saving results from reduction in tools required. In the case of the hydraulic lift, each of the 17 "teams" requires a full set of tools. With the assembly line's departmentalized type of operation, approximately only two complete sets of tools are required for a 1200-cc engine operation.

• Versatility of the assembly line is emphasized by the fact that it can readily be changed to handle different sizes of engines. This is a job of considerable



Sheaths for Magnets

Now 400-ton die casting machine casts aluminum sheaths on large magnets, such as those used in radar stations, the insulation and to simplify their installation. In casting the iron flask using at 2,000 psi, the special molding method can produce the sheaths on the two-piece body—they supply their own magnetic "pull" in 1,000 psi pressure over the finished work from the machine. Some of the permanent magnet plant at Chrysler Corp. of General Electric Co., Edison, Mich.

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Another turboprop first by Aeroproducts!



NAVY R3Y TRADEWIND WITH AEROPRODUCTS TURBOPROPS COMPLETES RECORD HOP!

Convair eighty-ton cargo-transport, powered by Allison gas turbine engines and Aeroproducts turbopropellers, flies coast to coast in six hours for seaplane record

Aeroproducts turbopropellers made flight history again February 24 when they helped power the Navy's giant R3Y Tradewind on the first cross-country hop of a turboprop seaplane. The 80-ton Tradewind flew nonstop from San Diego, California, to Patuxent River, Maryland, in six hours. A cargo transport, the R3Y sets the broad toward wide use of turboprop engines and turbopropellers. This pioneering flight also marks another first for Aeroproducts. In 1965, an Aeroproducts turbopropeller was used on a Convair F-41 in the

first flight of a turboprop-powered plane in the United States. In fact, Aeroproducts turbopropellers have more flight time than any other American-made turbopropellers.

But turbopropellers are just a part of Aeroproducts' contribution to safer, more efficient flying. Aeroproducts is ready now to meet your specifications for other propellers, air-driven emergency generators, air-driven hydraulic pumps, actuators, other aircraft components still in the development stage. Call or write for details.

General Motors engineering leads the way



Building for today...Designing for tomorrow
Aeroproducts

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Self-Propelled Cuts—An interesting innovation in Kelly's East Kalamazoo plant is the use of self-propelled carts which are loaded at will to underfloor continuous chain. The underfloor carts are used to haul parts, spares, scrap, etc., from one part of the factory to another.

As each cart is dispatched, it is coded with a steel pin, attached to its gate, which signals its destination as it goes. As the carts move from one bay to another, they trip switches which automatically open first one, then the other of double supply doors. This safety device at just under a walking pace.

Kelly's new parts store for the Avons are located at the foot of the subassembly lines leading into the main line. Shelves, racks and bins are welded metal pulley racks to fit into one another. Only three basic types are used.

They can be rearranged at will with a fork lift truck. All bins, racks and shelves are coded according to the part to be stored. Whenever practical, storage space is fitted to accommodate only specific parts.

Units to be taken out of store for transfer to subassembly lines are placed in fitted boxes similarly equipped with



Heavyweight Forging

Here is the largest aluminum alloy diesel die forging ever made for the aircraft industry, states Badger Forge Co., Coon. Weighs over 2,000 lb. and dimensions are about 18 ft. Forging was made on a 16,500-ton press at Badger's Alameda Division, Alameda, Mich., where company operates a plant leased from USAF. It was reported that such a large forging would require a much larger press, such as the 15,000 or 30,000 ton units in the Air Force heavy press program. Production of the dies indicates that with special handling, capacity of the 16,500 ton press can be increased, leaving the heavier presses for even larger jobs.

fitted, coded compartments. Each trailer has enough space to store 10 subassemblies. It takes 60 such carts to store all parts and components to make 10 completed Avons. Carts are filled by stress checks and checked out as needed by subassembly workers.

A pneumatic tube system is being installed to speed paperwork. Cartmats will be guided through a single-track system by preset sound rods, sequenced to various destinations. An automatic monitor in the system reads out error cartmats that makes the cartmats move without finding a home.

All work within the various bays are suspended inside each bay. As little as

possible has been previously installed. The work plant could be completely rearranged over a weekend.

New NAA Adhesives

Two modified phenolic adhesives for use in high temperature and humidity environments have been developed by North American Aviation, Inc., of Downey, Calif. NAA Hi Temp is used for bonding metal and reinforced plastics, CHT is for bonding "sandwich" components. NAA has licensed Badger's E-Adhesive Corp. and American Latex Products Corp. to make and market the new adhesives.

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This new booklet is offered by California Metal Engineering Company, a pioneer in the development of ceramic coatings. The 8-page booklet gives the full story on ceramic coatings for metals. Complete with photos, charts, engineering data and sample of a ceramic coating, the booklet describes new coatings developed for many aircraft applications.

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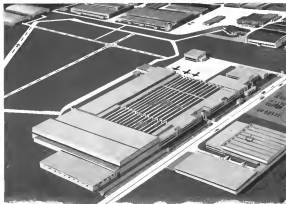
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Canadair facilities also include such important factors as ample skilled labor, extensive purchasing experience, proved sub-contracting sources and easy access to raw materials. Yes, Canadair's manufacturing facilities are such that people who know say, "You can count on Canadair."



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100-100

How Goodyear Produces B-47 Canopies



1. **GLOVE-GLAD** workers lift hot metal of heated Plexiglas laminate for heating on fixture where shape will be blown at Goodyear Aircraft Corp. facility at Akron, Ohio.



2. **FORMED CANOPY** is sent to spruing down position as jig is pressed hot in mold. Canopy is ready for removal.



3. **OPTICAL INSPECTION** as heat of grid board shows up any distortion. Canopy in this photo is for Republic F-3-D.



4. **IN BLOWING JIG**, sheet is held in place by pressure-balanced lockhead. Compressed air flows sheet into canopy shape.



5. **CONTOUR TEMPLATES** are used to check if contour is within engineering drawing tolerance for aerodynamic smoothness.



6. **STACKPILE** OF B-47 CANOPIES under dries or freeze hard before Plexiglas gives final production.



MANUAL WELDING shows speed of about three inches/minute. **Automatic device** (right) will equal application of manual welding



TURBINE ASSEMBLY has long welds made without filler rod. **Closeup of sample weld** (right) shows only small trace of heat radiation.

No-Rod Method Better Titanium Welds

Important new titanium welding process is said to provide ductility equaling or surpassing that of the base metal, considerably improving the quality of aircraft parts made from the new metal.

Basically, the process involves joining titanium sheets without using filler rod. Since there is said to be no need for grinding titanium beads at this new process, the problems connected with this requirement have been eliminated. Normally, titanium weld bead grinding causes severe wear on abrasive wheels and takes some time. Also, overheating at the joint can result in localized embrittlement of the weld that can cause failure.

► **Afterburner Production**—The no-rod technique has been used in fabricating a turbojet afterburner throat. The parts have been tried in heated production and are now performing successfully in service applications, it is reported.

The paper was delivered recently by Levy to the Los Angeles section of the American Welding Society. The paper was scheduled for another presentation at the Western Metal Congress, sponsored by the American Society for Metals in Los Angeles last week.

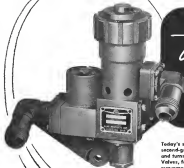
► **Major Improvements**—No-rod titanium welding's major improvement is the reduction in contamination from the surrounding atmosphere, enhancing the weld's ductility. Levy and Wickham point out that the oxide layer on the rod itself also is eliminated.

Even initial experiments resulted in welds whose strength, indicating a minimum of contamination from the air.

Maquardt researchers looked after subsequent testing that joint properties could be improved considerably by modifying the welding variables. These include the composition and material used in back-up bars, the extent of hold-down or chill bars, metal cleaning methods, welding machine settings, and the effects of gases on flows on the face and bottom of the weld.

► **Effect of back-up bar materials and configuration**. Original tests used a

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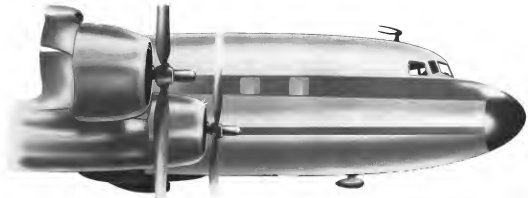


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have tapered to smooth convex shape, withdrawn and raised in cold running water, followed by a hot water soak to speed drying. Treat in the seal bath twice from one minute to 15 minutes depending on the bath's chemical activity.

Other Techniques—To keep arcing during gas flow entering the weld to a minimum, lowest possible current setting or least argon was used on the welding machine.

The machine is a P & H 200 HF-GW in conjunction with an HW No. 4 Linde torch and a No. 8 constant cup and a 3-in.-250-throated tungsten electrode.

Argon flow effects on weld face. Since no filler rod penetrates the argon gas distribution around the weld puddle, a more effective, unimpeded blanket is created that flows around the actual molten zone in a more symmetrical pattern.

Gas pressure setting is critical, the Musgrave engineers report, and it varies with wall thickness and metal being: the higher the current and the thicker the material, the greater the gas flow.

Too high a pressure creates two undesirable conditions. The first joint has excessive face area due to the weld being depressed by the gas. Also, the close proximity and configuration of

Conditions for Welding Without Filler Rod

• **Welding Machine**—P & H 200 HF-GW with Linde 35-W, No. 4 or 18 torch, No. 8 constant cup and 3-in.-250-throated tungsten electrode.

• **Back-up bar**—0.7-in. thick cold steel with rectangular groove 7/8 deep x 1/2 wide (1-in. thickness of metal to be welded). One-eight-inch holes for argon back-up gas placed about six inches apart along the base showing two inches from the edge of the sheet.

• **Hold-down bar**—Mild steel bar 1-in. thick x 1 1/2-in. wide clamped on the cold side at 90 deg. to 3/4-in. thick. Clamp bars is close as possible to the work.

• **Cleaning**—Metal should be either rubbed with a stainless steel brush prior to welding or pickled in a five percent

hydrofluoric acid, 95% nitric and both for 15 min. metal scale is visually removed.

• **Machine setting**—As low as possible to produce 100% penetration. For 0.40-in. thickness current 75 amp., voltage 25 amp./d.c., straight polarity.

• **Argon gas flow**—through the welding torch, 12 cfm for 0.40-in. thickness, and varying with other thicknesses. Flat back-up groove, 12 cfm for each six inches of joint length of 0.40-in. thickness, varying with other thicknesses.

• **Manual welding speed**—Approximately three inches per minute for 0.40-in. thickness.

• **Metal having a stressed surface**, resulting in a no-grip joint, is repaired for a satisfactory weld.

• **Argon flow effects on weld bottom.** Key to results of the fused no-rod type is gas pressure on the weld's root side. Back-up pressure has to be closely controlled and regulated to the metal thickness.

Margaret found that optimum flow rates vary from one cubic-foot per hour to five cubic-foot per hour for each six inches of joint length. For 0.40

inches produces a valley in the joint region.

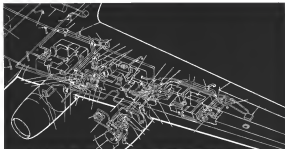
High argon pressure creates a gas flow pattern that tends to roll counteracting air into the joint. The effect of the argon pressure out of the constant cup is stored to be perfectly important in material of 0.50 in. and thicker. On 0.40-in. material, the flow rate was reduced to 12 cfm.



The Vickers Viscount is manufactured by Vickers Armstrongs Limited

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If you have a problem involving the production of high-quality aircraft tubing, SUPERIOR can undoubtedly solve it. Write SUPERIOR Tube Company, 2035 Germantown Ave., Norristown, Pa. Or the West Coast Pacific Tube Company, 5710 Southwest St., Los Angeles 32, Calif.



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TWIN J-57s POWER THE



SWIFTEST FIGHTER and the first with two J-57 engines, is this new "custary series" Air Force fighter being tested at Edwards Flight Test Center in California. The big, long-range McDonnell F-101 is 47 feet in length and has a wing span of 39 feet.



ONE OF THE DIVISIONS OF
UNITED AIRCRAFT CORPORATION

NEW VOODOO FIGHTER

The most powerful jet fighter ever built in America—the first with two J-57 turbojets—is joining the U. S. Air Force's supersonic team of "custary series" fighters.

It is McDonnell's F-101 Voodoo, a long-range fighter-bomber capable of carrying atomic weapons and slated for service with the Air Force's Strategic Air Command.

Like its supersonic sisters, the F-100 Super Sabre and the delta-winged F-102, the F-101 Voodoo is designed to take full advantage of the tremendous thrust provided by Pratt & Whitney Aircraft J-57s and their afterburners.

In the new Voodoo, Pratt & Whitney Aircraft's J-57 continues to make its vital contribution to American Air Power.



OVER 20,000 POUNDS OF THRUST and outstanding fuel economy are available in the F-101 from twin P&W J-57s and special afterburners, like that on the J-57 shown above. They are about two feet shorter than older J-57 afterburners. This engine equipment makes the long-range Voodoo the most powerful fighter known today.

Pratt & Whitney Aircraft

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New HIGH INSERTION LOSS NOISE FILTERS

New Sprague brings you a complete series of miniature, beaded-coating, non-inductive filters for aircraft and mobile electrical and electronic equipment to ratings from 0.1 ampere to 20 amperes for both 125 volt dc and 125 volt ac, 60-cycle service. These filters meet all personnel MIL and AN requirements for operation at temperatures from -55°C to +55°C. All designs are hermetically sealed with glass or ceramic-to-metal solder and sealants.

These filters are available to meet your production schedules from the Wire and Resistor plant of a specially designed manufacturing line Engineering Data Sheet on the units in which you are interested, write today to the Technical Literature Section, Sprague Electric Company, 11125 West Washington Blvd., Los Angeles 66, California or 427 Marshall St., North Attleboro, Massachusetts.



SPECIFICATIONS

MODEL	VOLTAGE FREQUENCY	CAPACITANCE (pF)	WEIGHT (oz.)	TEMP. RANGE (°C)	INSERTION LOSS (DB) AT RATED FREQUENCY (MIL-STD-202)					
					10	20	30	40	50	60
10	125VDC	1250	1.5	-55 to +55	30	30	30	30	30	30
1	125VAC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VDC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VAC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VDC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VAC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VDC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VAC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VDC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VAC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VDC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VAC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VDC	1250	2	-55 to +55	30	30	30	30	30	30
1	125VAC	1250	2	-55 to +55	30	30	30	30	30	30

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OSCILLOSCOPE TRACE shows whether brushless motor is good or not

It is not so the laboratory for check by member STU motor development. The oscilloscope's different wave forms indicate the type of defects such as undercurrent, commutation and the like.

Consume-Ft. Worth engineers report on the STU motor development. The B. M. Cunningham, E. L. Grogg, C. E. Hines and J. L. Smith. The work at Stanford was handled by James A. Arndt.

Navy Contracts

Contracts recently announced by the Navy's Aviation Supply Office, 700 Robinson Ave., Philadelphia 11, are:

1. B. M. Cunningham, E. L. Grogg, C. E. Hines and J. L. Smith. The work at Stanford was handled by James A. Arndt.

2. B. M. Cunningham, E. L. Grogg, C. E. Hines and J. L. Smith. The work at Stanford was handled by James A. Arndt.

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10. B. M. Cunningham, E. L. Grogg, C. E. Hines and J. L. Smith. The work at Stanford was handled by James A. Arndt.

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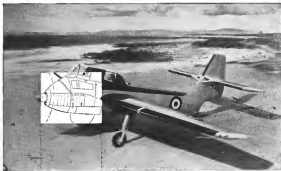
12. B. M. Cunningham, E. L. Grogg, C. E. Hines and J. L. Smith. The work at Stanford was handled by James A. Arndt.

13. B. M. Cunningham, E. L. Grogg, C. E. Hines and J. L. Smith. The work at Stanford was handled by James A. Arndt.

14. B. M. Cunningham, E. L. Grogg, C. E. Hines and J. L. Smith. The work at Stanford was handled by James A. Arndt.

15. B. M. Cunningham, E. L. Grogg, C. E. Hines and J. L. Smith. The work at Stanford was handled by James A. Arndt.

Sand strip - Seamew base



Simplicity of design makes assembly of Seawew easy and assembly is almost cut and to use of open and complete. Removable landing gear makes amphibious easy assembly.



The whole of the Seawew can be easily changed with different sizes of gear to suit the surface from which it operates.



The **Short** answer is the **Seamew**

Complete flap surface controls in the way low landing and landing speed. The Seawew requires the minimum length of runway on emergency landing or short carrier deck.



IN QUANTITY PRODUCTION FOR THE ROYAL NAVY

Short Brothers & Harland Ltd., Queens Island, Belfast, N. Ireland. The first manufacturers of aircraft in the world

"Cherry Rivets in here need substantial repair work that has been done on them," says American Airlines.



Cherry Rivets speed overhaul and repair at American Airlines Depot

Keeping the huge American Airlines fleet in top operating condition is a big job that requires an excellent operation of skilled operators, a variety of special equipment, and huge stocks of replacement parts—plus good facilities such as Cherry Rivet Rivets.

At American Airlines' Tulsa Overhaul and Repair Shop, for example, they say, "We have recognized the use of the Cherry Rivet and its application in the overhaul and repair of our equipment. Cherry Rivets are used in the overhaul of aircraft engine components, passenger seats, secondary structure of aircraft fuselage and engine cowling. They prove to be a most satisfactory means of riveting where Rivet fasteners are required."

Here and in other repair shops at the world's airlines, Cherry Rivet Rivets

also provide a fast, safe, secure method of fastening. They are specially designed to ensure the accuracy of securing entire sections to gain access for replacement of damaged sections and parts. They also speed out of the shop for quick repair—helps keep operating expenses down.

Cherry Rivets are installed by one man from one side of the work by a special gun which pulls the rivet into the hollow shank—expands the end on the blind side—fully closes the rivet in place—like the hole—all in a split second. Riveting is simplified. To learn how you can speed repairs and reduce maintenance costs with Cherry Rivet Rivets in strength and other industries, write for Bulletin TL-78—it is yours for the asking.

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area and provide disposal of spent liquids and cartridge cases.

► **Chardacraft TV** will be used to transmit pictures of gauges, panels and equipment reports and for communications between Bethpage and Pocomo River, N. Y., plants of **General Aircraft Engineering Corp.** Also a satellite TV center will permit Bethpage personnel, 50 mi. from Pocomo River, to watch tests of the latter plant.

► **M. H. Sweet Engineering Co.**, Huntington, N. Y., plans to design and produce six navigation equipment, radio aids and do research and development in photo-electric measuring instruments. President of the new firm is Monroe H. Sweet, formerly of Anco Chief engineer in **James Cardillo**, presently with Anco and Link.

► **Talley Machine & Manufacturing Corp.**, maker of electro-mechanical and pneumatic actuators and hot air valves for military planes, plans to build a factory, double its present 15,000-sq-ft facility, in Ventura County, Calif.

► **Hartwell Aviation Supply Co.**, Los Angeles, has opened a branch office in Ft. Worth. It is being a Howard Bank.

► **Redgrip Thermotek Inc.**, Robertshaw-Hall Co., is building a \$3-million plant at Milford, Conn., scheduled for occupancy in July. The Milford plant will make metal bellows and automatic controls for these devices.

► **Hiro, Goldsmith & Co., Inc.**, has established a Western Div. in Los Angeles to handle an increasing demand from aircraft and marine makers for flat plate metal. It is a change of the new facility in Paul A. Enloe.

► **Paischild Co. and Instrument Corp.** is building a 24,000-sq-ft plant near Los Angeles. Occupancy is planned for June.

► **Module-type high vacuum furnace** has been delivered to Metallurgical Development Laboratory of Westinghouse Electric Co., Bloomville, Pa., by General Electric Vacuum Corp., Rochester, N. Y. Westinghouse will rapidly operate the unit at 150-lb. capacity. By interchanging tool and cooling equipment, the furnace can be operated at 1,000-lb. capacity without diverting basic installation.

► **Dynamic Sales Enterprises, Inc.**, 101 Park Ave., New York, has been named by Paischild Co. to handle the sales representative for electronic laboratory equipment and other related devices developed by the firm as a subsidiary to its mobile television work.

Cold-Forming Tool Spins Metal Parts

Selectable springs in material and labor costs in the cold-forming of cylindrical metal components for use in high temperature areas of turboprop engines at Solar Aircraft Co. from one of a new 35-ton Hydrospring Machine recently shipped to the firm's San Diego, Calif., plant.

One \$40 part, now made from a hemispherical casting which is then machined and welded, can be developed on the Hydrospring for \$15, Solar says.

A major use for the machine will be in forming deep-drawn container components. Previously they had been fabricated in two sections and welded together, requiring special dies and fixtures. The Hydrospring will form these from a blank disk.

Solar states that as more parts, Hydrospring takes only one-fourth as much material as tool is doing per component.

Parts made with the new machine also are claimed to have greater fatigue resistance than made with former methods, because the process promotes stress deformation, resulting in work hardening the material and increasing tensile strength.

The Hydrospring unit contains a metal



HYDROSPRING allows shape molding just against rotating mandrel.

disk at high speed and two metal rollers force the metal over a rotating mandrel to form the desired shape while rollers advance it along a guide curve. Except for loading and unloading, the machine is automatic.

Made by **Cincinnati Milling Machine Co.**, Ohio, the machine is valued at approximately \$100,000.

A member of similar cold-forming

machines, called flow forming, was developed recently by Pratt & Whitney Aircraft (AW) Sept. 13, 1954, p. 25.

ODM Grants Writeoffs For Aviation Facilities

Ambient Laboratories, Inc., Rockville, Md., has been granted a certificate of indebtedness by Office of Defense Mobilization for a military aircraft engine parts facility costing \$1,214,310, with 65% allowed for capital expenditures.

Other certificate awards issued last week:

► **Provision Tool & Mill Co.**, Woodfield, Ill., machine parts for aircraft and aircraft engines, \$22,000 certificate with 10% allowed.

► **D. R. Reed Machine Works, Inc.**, Rockville, Md., military aircraft parts facility costing \$1,195,000.

► **Thompson Machine Co.**, Chicago, and some components \$112,310 certificate with 10% allowed.

► **Emery Division of General Dynamics Corp.**, St. Louis, aircraft and components, \$100,000 certificate with 10% allowed.

► **Robert Gray, Inc.**, St. Louis, aircraft and components, \$100,000 certificate with 10% allowed.

► **Thompson Machine Co.**, Chicago, aircraft and components, \$100,000 certificate with 10% allowed.

► **Thompson Machine Co.**, Chicago, aircraft and components, \$100,000 certificate with 10% allowed.



"I'm glad Capital Airlines specified Permoflux Dynamic Headsets!"

"I Hear You LOUD and CLEAR"



Model 100-200
Dynamic Headset

News in Top Management

Anyone who has been wearing high-quality, high-fidelity sound... knows the kind of sound played by headsets in the most important communications... of all flying operations. After extensive tests... Permoflux Dynamic Headsets have been found to be the most important... in the air as well as on the ground. They are the most important... Capital Airlines and Trans Canada Air Lines.

Permoflux Dynamic Headsets have been found to be the most important... in the air as well as on the ground. They are the most important... Capital Airlines and Trans Canada Air Lines.

Permoflux Dynamic Headsets have been found to be the most important... in the air as well as on the ground. They are the most important... Capital Airlines and Trans Canada Air Lines.

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Locking Insert Permits Blind Fastening

New device increases flexibility in design of fastener installations; WADC to test it in F-86 'wet wing.'

DuPont, Conn.—Heli-Coil Corp. has developed a threaded, stainless steel insert with a squared bottom cut that acts as a screw lock.

The insert has been approved in certain cases by Wright Air Development Center and is being used or considered for use of the country's latest jet aircraft, including the Convair F-102, North American F-100, Sikorsky S-58 and Douglas F-4, F-7 and F-8.

Illustrates Gripping—By freely using the bottom threads of a bolt, screw or stud, the screw lock inserts eliminate use of lock washers, lock nuts and similar gripping devices in internal locations.

They are being considered for wind shield design for those Glenn L. Martin proposals entered in military design competitions and a windshield design for Republic's advanced F-105.

Windshield Use—The threaded locking device has two advantages over conventional bolt and nut fasteners when used in windshield installations, according to Heli-Coil engineers.

Space saving, which permits wind shield parts to be made thinner, increasing clear area.

Better vision. Because blind nut fasteners may be used with the inserts, no nuts need be located in the driving but air space unobstructed between outer and inner windshield panels.

Smooth exterior contour allows even air distribution across the entire wind shield, avoiding overall deflection with air speed spots, say Heli-Coil officials.

Good to Tanks—WADC will now check-out an experimental "wet wing" design for an F-86 incorporating approximately 400 Heli-Coil screw-lock inserts.

WADC spokesman says that "the application provides a locking insert in a blind hole, thereby eliminating the potential fuel leakage point which normally exists in such fastener through the fuel tank boundary." Aero-Cal Divisions of Crutcher & Manufacturing Corp. designed and built a prototype section of internal fuel tank wall for thick-glassed, thin-walled, high-performance aircraft for this test.

Inspection Panels—The screw-lock insert is proving useful as the attachment of inspection panels and covers for

equipment rack as avionics gear which have to be removed periodically for inspection or maintenance.

In such operations, bolts or screws are held tightly in place by the screw lock insert yet the nuts (washers) may be readily and quickly removed when necessary.

Advantages—Company spokesman says that this insert has two big advantages over conventional threaded locking devices.

It permits blind bolts (in combination with coneheads and bushings) to be used in those applications for the first time. The device's screw locking action, derived from its specially formed lower threads, permits the dislocation of lock washers of gripping device between the mating surface which the fastener is passing. This feature gives an infinite design greater flexibility in solving fastening problems.

On starting or back-away torque tests, screw lock insert's torque remains approximately constant after an initial 15% increase when the coneheads allow break away torque to drop to from one-half to one-third of initial torque after 35 revolutions, Heli-Coil claims.

That is what Spec. AN-N-59 calls out in sample minimum starting torque values for 1/8, 1/4 and 1/2 inch inserts, according to size. Size 10-32, 1.2 and 1.9 in. lb.; 3-24, 16 and 9.6 in. lb.; 4-20, 10.2 and 14.1 in. lb.

Here are actual test results using a 10-32 1/8-in. blind and screw lock insert. Initial starting torque of 6 in. lb. and final removed dropped to 3 in. lb. vs. 15% removal—but only because of wear on the male member. When bolts were replaced using 15th revision torque removed at 4 in. lb. up to 15th revision.

On another test, torque at the 15th revision actually exceeded that of the first revision because fastener used was a minimum tolerance bolt.

In still another test, the same bolt was used for all 150 assemblies. Result: starting torque dropped from 6 to 0.5 in. lb. from first to last removed because of bolt wear.

The inserts are designed to spec MIL-N-15877, which combines and supersedes specs AN-N-59 and AN-N-160.

Four Other Categories—This is how the screw lock insert stacks up to the four other categories of tests listed in



SQUARED THREAD (lower) stress end of bolt, eliminating need for lock washer



TYPICAL application of new Heli-Coil insert as F-86 experimental "wet wing" integral fuel tank. (a) in place, (b) after attack, (c) after removal (last firing)

AN-N-59 (all tests conducted with size 10-32 bolt)

• Torque-out (single-to-failure) tests show that the insert has a safety margin of approximately three-to-one over standard installation torque as specified

Aircraft Engineers



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out in IRAD (Headbook of Instructions for Aircraft Designers), according to company spokesmen. Actual values vary with use and material.

- **Tensile strength** of the inserts meet or exceed spec requirements in both structural and non-structural uses.
- **Preloading torque** (in engine torque which prevents them from being torque) meets or exceeds spec requirements.
- **Vibration tests**, conducted in WAEC approved vibration machine, showed that the screw-lock inserts meet all specification requirements.
- **These** Sixes Approved-Helix-Cell screw lock inserts are precision formed coils, usually but not always made of 18-8 stainless steel with having to ultimate tensile strength of approximately 200,000 psi.

Wright Field has approved their use in these sizes, 4-32, 10-32, 1-18. These other sizes, 4-12, 10-24, 1-10, have been approved then for for special applications.

Paul E. Wolfe, director project engineering, says that not only does the screw-lock insert permit elimination of lock pins and lock washers, saving weight and space and allowing reduction in screw length, but elimination of lock-washers eliminates an on-assembly area where installation time. Also, screw or bolt can be easily removed by applying near "0" torque as used

for angular assembly, and use of steel and instead of drilled hole both cuts costs.

- **Insert installation**—Use of the screw-lock insert requires two steps. The insert is installed in a tapped hole with a preloader type of inserting tool. The insert is then sealed with a tapered, precision threaded tool, which seals the gap of the insert.
- **Helix-Cell** affords any the insert could have more non-structural uses. Among them are holding a set screw in a pulley so it cannot loosen and grip ring adjusting knobs so they stay in any desired position in vibrating bodies such as automobiles or engines.

Conveyors Speed Overhaul at NWA

Northeast Orient Airlines has expanded and "conveyered" its engine engine overhaul shop at Holmes Airport, St. Paul, to handle four Lockheed 1196C Super Constellation being delivered.

Based on a careful study of overhaul methods used by the country's major airlines, the new system includes an 890-ft. overhead conveyor system, a work conveyor system in the engine shop and three traveling cranes in the sub-assembly area.



Costing \$70,000, the "continuous flow" system will speed up engine overhaul, reduce manual operations, ease handling of heavy engine parts and generally improve the shop's overall efficiency, NWA notes.

The shop will handle five types of aircraft engines: Pratt & Whitney R4360 (Boeing Stearman), R3360 (Douglas DC-6B), R2380 (DC-4), R1550 (DC-3), and the Super Constellation Wright Turbo Compound R3550.

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WARSAW - INDIANA

Riddle Stretching C-46 Engine Period

Riddle Aerobics hopes to raise over half ton of the P-40 R2580-31 M15 power, its C-46s to 1,400 h.p. in a run of accelerating over 17,000 h.p. in this engine without a single failure. The crew currently is getting 1,100 h.p. on each engine before change.

During the 17,000 h.p. period the only malfunctions experienced from 100 blower updrafts, one changed cylinder and one low tappet failure. All engines, including the ones that malfunctioned, operated 1,000 h.p. between

overhaul. Riddle states:
The M1 modification was developed by Air-Crane Engine Service, Miami, Fla. (AW Feb 3, 1954, p. 64).

Changes include: forged aluminum cylinders for improved cooling; large capacity oil pump and like-type cam and valve mechanism; also modification of the blower section.

F-86D Turbopump Is 3-in-1 Unit

A new air turbine-driven afterburner fuel pump cuts 25 lb. from the weight of F-86D Saboteurs on which it is in-

Big Mod Job

Finally the most extensive modification of a commercial turbine afterburner is a new timing filter at Lockheed Aircraft Service International's new hangar at New York International Airport.

The service agency is completely modifying a number of Boeing Saboteurs recently purchased by British Overseas Airways Corp. from United Air Lines. The "from-the-throat-on" changes include such major operations as installing eight square inch and six square inch, complete modifications, complete passenger cabin rebuilding from modification to interior fabric, baggage carts and aisle seats, seating arrangements, new propulsion and complete paint job. Six aircraft are involved. Another fleet of BOAC's Saboteurs are undergoing intensive modification.

stalled. The pump is in reduction at General Electric's Lynn, Mass., works. Called a "turbo-pump," the unit incorporates three pumps in one and is mounted inside the fighter's fuel tank, eliminating need for separate boosters and high-speed pumps and tank



Navigation Trainer

Fuller navigation at simulated speeds of 1,750 mph and altitudes of 30,000 ft. can be undertaken in this new Link D-2 trainer installed at Mather AFB, Calif. The huge device is composed of a 12-mph overhead structure set on two sets more than 500 sq. ft. accurately positioned lights duplicate the major stars of 31 constellations over the Northern Hemisphere above 24 deg. North latitude. It was developed under USAF contract by Link Aviation, Inc., Birmingham, N. Y.

heavy piping and wiring, according to GE.

The 55-gal. pump is driven by bleed air from the plane's J47-J3 jet engine. The pump's built-in vapor separator prevents the unit to upset the fuel flow requirements for the F-86D's high rate of climb.

OFF THE LINE

AC Spark Plug has appeared for use distribution with extensive territorial coverage as part of an expanded aircraft parts program. The distributor will carry AC's complete line of aircraft spark plugs as well as some AC engine components. The distributors: Pacific Automotive Corp., Beahm, Calif.; South West Automotive Corp., Dallas, Texas; Auto Corp., Nashville, N. Y.; Van Dusen Aircraft Supplies, Inc., Minneapolis; and Standard Aero Engine Ltd., Winnipeg, Canada.

Lockheed Aircraft Service International, N. Y. International Airport, Jamaica and 1,700 in daily and occasional aircraft in 1954 following overhaul and modifications, an increase of 755 planes over 1953. Most planes handled were DC-6s with DC-6s and Super Constellation. LASH employs 1,100.

STRESS AND STRUCTURES ENGINEERS

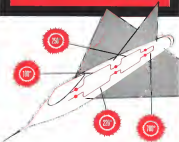
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Tubeless Tire Passes Impact Tests

Development of a high-pressure tubeless airplane tire capable of absorbing the severe shock of landings or take-offs at 300 mph. has been announced by B. F. Goodrich's Tire & Equip. div. Dr. Goodrich says this tire is the first of its type.

According to Tire and Equipment Div. president Arthur Kelly, the new tire recently passed impact tests of 10,000 lb. at 300 mph, although it is no larger than a passenger car tire.

One of its most features is a special tread capable of withstanding the extremely high temperatures and stresses developed by high speeds and heavy loads.

The dynamometer used to test the new tire employs an electromagnetic clutch between the electric motor and the road wheel that controls the speed to any predetermined deceleration rate, and loads can be controlled while the wheel is in operation. In the dynamometer landing tests (the new tire has not yet been tried out in actual landing) the new tubeless tire was

run against the wheel, spinning at 300 mph. The test was held against the wheel for a length of time equivalent to the distance an aircraft would travel on the runway when making a landing.

Kelly says the new tire uses up to 40% of tube weight. Basic construction principles are similar to those patented and used in B. F. Goodrich tubeless tires for passenger cars. A layer of special rubber inside the tire acts as the air retainer in a vacuum tube. Ridges embedded on the outer side of the tire bead prevent loss of air around the rim flange.

Absence of the vacuum tube permits close control of tire balance and resultant minimizing of high-speed spin-up vibration. Design of a pressure tube is also eliminated. In addition, the layer of special rubber inside the tubeless tire enables it to remain as nearly "square" than the conventional tube for airplane tires, Goodrich says.

B. F. Goodrich, Tire & Equipment Div., Akron, Ohio.



UNITS come in 12, 20 and 115-hp. models

Portable Power Generator Weighs Only 30 Lb.

First of a complete line of portable electric power generators designed for ground use, various outputs and suitable for lighting, operating electronic devices, heaters, air conditioning and supplying power for radios, has been developed by Gen-Cat Div. of Lear, Inc. Weight is 30 lb.

Model 9500-B supplies 26 v. d.c. at 30 amp continuously. Fuel consumption is under 0.5 gal./hr. The engine has an automatic ground starter and a muffler.

The auxiliary generator comes equipped with a carrying handle. Section-cap feet aid in dragging, vibration, also keep the unit from shifting around when operating or stored. Other models range from 33 v. to 110 v. system.

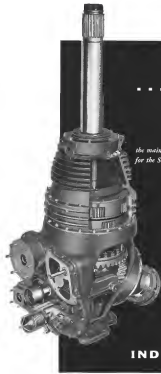
Lear-Cat, 5173 Third Beady Drive, Santa Monica, Calif.

Panagra DC-7s to Get Mated Berthing Chairs

Berthing arrangements will be simplified on Pan American-Grace Airways' new fleet of Douglas DC-7s by use of a new line of seats that eliminate the need for two types of berthing chairs to make up a double berth.

The new maker has designed Airlines cushions that are contoured on the bottom to mate with the seat cushions and back cushioning of the berthing units. Full berthing chairs are slated to have all of the comfort and styling of reclining lounge seats. This makes it unnecessary to have ordinary and full berthing doubles to form one double, it is pointed out.

Full berthing chairs are designated Model 3994 series; airplane double-reclining lounge chairs are Model 3016DA.



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High on the list of "things we are proud of" at IGW is the transmission shown here (demonstration cut-away). Precision built to transmit 700 H. P. with an input speed of 2400 RPM and a reduction ratio of 11.348 to 1. In spite of high stresses and great complexity the service life of this transmission has been outstanding.

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STARTING PACKAGE has proved Navy as efficient tool. Two versions are available

Jet Starter Package Fits on Tow Tractor

A jet aircraft starting package (available in two versions) of a tow tractor has recently completed U. S. Navy acceptance tests, the manufacturer reports.

Originally designed for use on aircraft carriers, the unit is 21 in. high, 47 in. long and 36 in. wide over the wheel housing. Weight is approximately 400 lb. It comprises an Air-Rotch jet turbine compressor which delivers 185 lb. of compressed air for starting jet engines, an aircraft-type battery, starting valve, reduced speed valve, auxiliary fuel-burner pump and a 4-gal. oil fuel tank.

The control lever permits the vehicle driver to operate all turbine functions, or they may be handled remotely

by the pilot in the airplane cockpit. The tractor comes equipped with two 10-ft. lengths of tow hose having external inside rings to break abrasion. An external power supply assembly is fitted so that the tractor can supply electrical power and starting air to the plane while towing it. Each tractor carries an auxiliary jet-fuel tank of at least 30 gal.

Model TCD-65 tractor with the turbine mounted in 45 in. high overall, the four-wheel drive Model TCD-66, 60 in. high, is designed for use at airports and advanced bases and can operate under DC-6 or DC-7-type aircraft.

Frank G. Rough Co., Libertyville, Ill.

Night Recording Camera Handles Missile Tests

Testing of missile trajectories is the job of a special night recording camera developed under U. S. Air Force contract for Redstone Arsenal Ordnance Station.

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Genies Electronics, No Hollywood, Calif.



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series. Chairs are now available for interchange with all Douglas convertible seats in DC-4, DC-6B and DC-7 transports and are also on hand for interchange on Douglas, Lockheed or Boeing Liner type trim in these Douglas and all Lockheed Constellation planes. Hudson Tool & Engineering Co., Los Angeles, Calif.



RUSTPROOF clamp holds plastic conduit

Hand-Tightening Enough For Plane-Conduit Clamp

A new clamp for holding flexible plastic tube was available to plane on aircraft can be tightened by hand, eliminating use of tools and saving many man-hours during servicing, the maker claims.

Device is machined from aluminum and has an anodized rugged finish. When used in conjunction with a pre-listed adapter, a waterproof joint is provided between the connector and the plastic conduit.

H. H. Baggs, Inc., Toledo, Ohio

ALSO ON THE MARKET

Acoustic gear grinder, costing about \$17,000 with all accessories, is offered to rent in Chicago. Special tooling designed into the grinder is said to eliminate need for high investment in costly special tools. Complete setup can be made in minutes, the maker claims—Reck Instrument Corp., College Point, N. Y.

Flexi Power, Inc. of Macdonald, Ohio, manufacturers of aircraft engine regulation and related equipment and test devices, has appointed Aeroquip Industrial Machine Sales Co. as Gulf Coast representative. Aeroquip Industrial's address: Van Antwerp Building, Mobile, Ala.

Portable arc welder has voltage characteristics adding a particularly useful for inexperienced welders or mechanics. Rating at 15-150 amp, generating welds of 1/8 in. steel. Unit may also be used as a carbon torch for heating, brazing, burning and welding of brass and aluminum—Chase-Turner Engineering Co., Somerville, Calif.

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AVIATION CALENDAR

- Apr. 13-15-American Society of Aeronautics Engineers, 10th annual meeting, Hotel Maymont, Chicago.
- Apr. 14-15-American Ordnance Assn., open session of Precision General Instruments Assn. Convention, Patrick AFB, Fla.
- Apr. 14-16-International Airline Navigation Council, 8th convention, San Francisco.
- Apr. 16-18-American Association of Aerodynamicists, 1953 annual convention and business meeting, El Comodoro Hotel, Tucson, Ariz.
- Apr. 16-18-Society of Automotive Engineers, 40th Anniversary Aerospace Meeting, Aerospace Production Forum and Aircraft Engineering Display, Hotel Statler and Sheraton, New York.
- Apr. 18-21-American Society of Mechanical Engineers, 40th annual meeting, including fluid aviation symposium, Lord Education Hotel, Baltimore.
- Apr. 20-22-American Rocket Society, spring meeting, Baltimore.
- Apr. 24-25-Aircraft Operators Council, 19th annual meeting, Reno.
- Apr. 25-26-Society for Experimental Science Analysis, spring meeting, Hotel Statler, Los Angeles.
- Apr. 25-26-American Helicopter Society, 10th annual forum, Hotel Maymont, Washington, D.C.
- Apr. 25-26-Mechanics Aeronautical Council Assn., University of Michigan, Ann Arbor.
- Apr. 29-30-Institute of Navigation, annual regional meeting, Friendship Airport, Baltimore.
- Apr. 29-30-New England industrialists meeting, sponsored by Boston and Middlebury College, Boston.
- Apr. 30-May 1-Naval Air, 10th West Wing annual convention, Sheraton Hotel, Chicago.
- May 3-5-Society of Aeronautical Engineers, national conference, Sheraton Hotel, Ft. Worth.
- May 3-5-International Society of America, 4th annual Flight Test Instrumentation Symposium, Sheraton Hotel, Wichita.
- May 6-8-40th International Aviation Trade Show, 6th Supplement Assn., New York.
- May 7-10-International Aircraft Maintenance Assn., World Airplane Maintenance Congress, Ft. Worth.
- May 7-8-National Inter-Collegiate Flying Assn., annual convention and air meet, Modesto Field, Ft. Worth.
- May 7-8-Association of Northeastern College Flying Clubs, annual inter-collegiate air meet, Long View, Maryland Airport.
- May 9-11-National Conference on Government Electronics, Baltimore Hotel, Dayton.
- May 10-20-National Materials Meeting Exposition, produced by College of Physics, International Airport, Chicago.
- May 21-24-American Society for Quality Control, 10th annual convention, Hotel Statler and Sheraton, New York.
- May 30-31-American Aerospace International and KIVALL, Royal Netherlands Air Force, 8th International Air Display, Tjallingii Airfield, The Hague.

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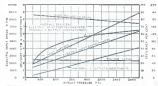
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- ★ EXPLOSION PROOF**
 Conforms to Specification MIL-46-6009.
- ★ LOWER POWER DEMAND**
 The more efficient pump means less current draw - - - longer emergency operation.
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AIR TRANSPORT

American Renews Airfreight Campaign

By Gordon Gaskley

American Airlines believes the air transport industry is leading its charges to final triumph into a major profit corner. To strengthen its own position, AA is trying to change airfreight from an emergency service to a routine shipping method.

The new campaign will rely speed as the primary advantage. But American is showing shippers how they can cut expenses by using this fast delivery service on a day-to-day basis.

In planning regular airfreight shipments, the airline says, shippers can lower their inventories, reduce warehousing, cut obsolete losses, simplify handling methods and, in many cases, open new areas of business.

Statistical Approach—The concept of major concerns through fast deliveries is not new. Since the start of airfreight, carriers have tried to sell shippers on the idea that speed would more than make up the difference between surface and air rates.

"But air transportation made no attempt to back up this concept," says Thomas J. Harris, American's manager of cargo sales. "No one came up with facts and figures that could be applied to individual companies to prove big savings were possible."

As the first scheduled airline to start flying freight in 1944, American had a hand in selling the unused cargo. Now AA is putting approximately \$10,000 into a program to give shippers statistical proof of airfreight's economy.

Airfreight Savings—This is easier to tackle, says one company at a time. All shippers agree to an analysis of their individual operations, American believes it can show how savings are possible through:

- **Greater speed** in most companies, faster shipments would then do business with less goods in hand. This would reduce warehousing costs, cut handling expenses and lower the number of items that become obsolete in storage.

Speed also would allow customers to get the new best service they possible as their immediate requests to customers in distant cities, speaking the way to new markets.

- **Better protection**. In air transport, American says, there is less chance of pilferage, theft and accidental loss. Etc. parts damage also is considerably lower.
- **Simpler methods**. Administrative work can be reduced, because hand notes,



AMERICAN DC-8A unloads freight at LaGuardia less than 24 hr. after leaving West Coast.

routes and rates, tracing, sorting and classification requirements for airfreight are easier to apply.

With facts and figures to back up these arguments, American believes its greatest sale of equipment for the immediate future is in the big commodities now handled by airfreight—but usually on an emergency basis.

These leading commodities are auto accessories and parts, wearing apparel, watches, cut flowers, electrical equipment, aircraft accessories and parts, biological medicines and drugs, printed matter, metal bars, castings, ingots or discs, cloth and fabric, advertising displays, newspapers, radios and phonographs, hardware, electronic components, paper and related products, dry goods,

instruments and automobile engines.

• **Increased Demand**—In operations, American is trying to improve airfreight service to meet new demands.

"The character of shippers is changing," says J. M. Glad, director of cargo services. "They are more demanding. They aren't satisfied with the service of a year ago. When a shipper used to allow for a 14-hour delay, he now plans immediate use of shipments."

That is an industry problem. If we are to retain the shipper's confidence, we've got to deliver on schedule."

To meet this stricter requirement, American is concentrating this year on dependability of delivery, condition of cargo and accurate information on schedule capabilities.

• **Continuation Advantage**—Operations personnel believe they have a better chance of satisfying their customer demand than other surface carriers in airfreight markets. "We have a tremendous advantage over all other lines," they say. "We have a big passenger fleet to back up our freighters."

Normally, AA plans on moving 60% of its freight on non-passenger passenger cargo transporters. The freighter fleet will increase 40 passenger ships. American takes delivery in 1955-57 of four Douglas DC-8As now on order, going the airline uses of the all-cargo aircraft.

American's DC-8As carry an average of 31,000 lb. of cargo—12,500 lb. on short-range flights and 24,500 on long-range. This compares with 20,000 lb. on freighter DC-4s and with 8,500 lb. on DC-5Bs, 6,700 lb. on DC-7s, 5,500

New Freightier

New all-cargo turbojet transport capable of flying 100,000 lb. payloads on the basis of at least two aircraft bodies. Production models are expected to be available after 1956.

"With one of these transporters," says an American Airlines spokesman, "we could carry freight at half the existing (two-model) rates of 21-22 cents."

But industry observers predict the transporters now will be exceedingly high, even if the government pays the research and development part by loan to the new freighter, more than \$4 million each.

in an DC-6s and 2,800 lbs. on Conquest 44s in the freighter category.

On DC-6As, "operational requirements are not as strict as on a Conquest 44," says the FAA. "The Conquest 44 has only one main cabin, and the new Douglas freighter has operational cost doesn't permit

lower rates, and we've got to reduce them to the freighter category equal to the passenger operation."

But the DC-6A is the first of its type to show a profit. American's all-cargo DC-6s do not make money except with a load factor of at least 95%.

Senate Committee Praises Copter Services in Feeder Airline Report

Senate's Interstate and Foreign Commerce Committee strongly encouraged the bid of the helicopter services in New York, Chicago, and Los Angeles for permanent certification.

In approving legislation granting permanent certification for the 14 existing local service airlines, the Senate committee expressed its "great appreciation for the pioneering efforts of the three certificated metropolitan helicopter carriers." Its report to the Senate said:

"Helicopter carriers within the local service category have demonstrated a sound business state. The most experienced ones have only recently received approval and begun passenger service with single-engine turboprops. Thus far, they have only demonstrated to show their commercial passenger-carrying capabilities."

Certification Granted. "When helicopter carriers have developed a suitable background of revenue passenger service, and a proper record of safety, it is reasonable to seek revenue certification to the present industry as a stage of the local service carrier, they may well be considered for permanent certification. One of the factors, the committee will watch the development of the helicopter carrier with interest and enthusiasm," the report stated.

Under similar bills passed by both Senate and House Commerce Committees one of which will be approved by both houses—the Civil Aeronautics Board would have to give the 14 local laws permanent certification within 120 days after enactment unless it can be shown that revenue status of the certificates has been "unduly and unjustified."

The committee recently discussed CAB's argument that permanent certification would "freeze" local route patterns and preclude improvement. They responded to the provision of the 1958 CAA Act giving the Board authority to "alter, amend, modify or suspend" in whole or in part, any certificate.

The Senate bill would authorize CAB to extend from permanent certification to use half of the aircraft as points of a common route.

Feeder Plan.—The local airlines now have a total route mileage of 30,000,

serving 448 cities—364 of them exclusively—with a total population of 47 million. The routes connect 161 airports and employ 4,000 flight crews and approximately 1,000 mechanics. There are only six states not served by a local service carrier: Connecticut, Maine, Rhode Island, Vermont, South Dakota, Nebraska.

Certificate Benefits

The Senate committee anticipated that these benefits will follow from permanent certification.

- "The increased and extensive diversity of economic talent to certificate aircraft passengers will be evident as that executive talent can be devoted to improving the operations of the airlines themselves and thereby better serving the public interest and promoting more economic recovery."

- "The expense added upon the carrier by certification proceedings, not estimated at \$100,000 for each certificate, will be lessened and that expense can be devoted to advertising, to such capital improvements, to maintenance and neighborhood aids."

- "The great expense and uncertainty to states and cities and other users of the feeder service who must dispose of their land to supporting regulations for renewal will be ended. Likewise the

great expense to the Federal government of having the Civil Aeronautics Board conduct such proceedings will be terminated and we may anticipate a consequent reduction in the administrative expense of the Board."

- "Safety and transportation which have existing history is unassailable. It offers will have more assurance that their investments in those facilities may be considered freighted rather than speculative."

- "The promotion of American commerce and national unity will be facilitated by strengthening and making permanent the system of local air carriers which now carry 14 million Americans by, from, and between the small and intermediate-size cities last year."

- "The local carriers may develop long-range permanent programs and allow long-range service to employees. In the past all contracts of employment with local service carriers have been short-range and have led to a permanent turnover rate more than that of the truck industry and a consequent high training and replacement expense."

- "The local carriers may, after passage of this legislation, make long-range arrangements for longer, more permanent equipment, maintenance, and other facilities with the consequent economy to themselves and the government that are inevitable from such arrangements."

- "Users of the services of the local airlines will be able to plan more planes and equipment of, in addition to, old planes and equipment, and the emergency service on which they depend is permanent."

New Aircraft

"Aircraft manufacturers may be concerned that they should design and build an aircraft tailored to the requirements of the local service airlines. Up to now the local carriers have been forced to rely almost exclusively on the DC-3-type aircraft. While this is a good and well-proved airplane, it has ceased to be an economical one for use for any commercial operation. At the present time no other American aircraft is in sight for the feeder except such as might be taken down from the truck industry in California or Michigan."

"Thus, like the DC-3, are good airplanes for the reason for which they were designed, but once again their utility to the feeder airlines is, to be more dynamic, pathological. Helicopters manufacturers have been most reluctant to undertake a new design of a true local-service-type aircraft because of their doubt that there would be any customers for such an aircraft by the time it was designed and ready to fly. Perhaps of this bill will encourage carriers that local feeder service is back to life."

- "The local service airlines will be able to establish sound financing programs on a long-range basis. Such developments in permanent contract rates on loans, from private banks to temporary certificate dates, personal guarantees on corporate assets loans, and other practices which the uncertain status of the local carriers have created until they may be either ended or ended."

Board Asks Airline Reaction to Crash Axe

Civil Aeronautics Board has asked its duty committee as a further proposal regarding crash axe on scheduled airline transport and made for luggage carts in the event of an accident.

The Board's original proposal was to take effect April 1, but immediate compliance has now been deferred until May 1 pending response from the airline industry.

Major objection of the industry was the suggested requirement for a second crash axe when more than 30 passengers are carried.

CAB readily acknowledged that further study revealed no necessity for a second crash axe. The Board also eliminated the requirement for chop axles on the outside of the aircraft fuselage.

CAB's proposal now, if adopted, would amend CAB Part 40 to read: "All airplanes shall be equipped with at least one crash axe and all emergency exits shall be clearly marked in such form as the statute."

Transportation Policy Draft Favors Railways, Release Unlikely

The Administration's long-pending transportation policy report probably will not be released publicly because of its politically explosive nature.

President Eisenhower ordered the Cabinet last week to be made but not. Commerce Secretary Sinclair Weeks a chairman and serving with his cabinet Secretary Charles E. Wilson and Defense Mobilization Director Arthur Flemming.

A summary of an early draft, obtained by the Wall Street Journal, indicates a collection of recommendations heavily weighted in favor of the railroads. The draft treats the subject of a general way.

Schedule Policy.—A basic concern in the report is the transportation policy that railroads should be allowed to engage in the bus and trucking business. This is viewed as a move which could lead to restraint of competition and retard development of independent forms of transport in favor of the railroads.

Effort will be made to research in railroad problems is advocated as an aid to the industry.

One recommendation is a second-order that the transportation system on freight and passenger be separated, something all types of carriers have been fighting for years.

Decline.—Most of the recommendations are not related to the decline of the White House, but they do find recommendations of the committee. The issues involved have proved so hot that the group working on it has been unable to fix a product as acceptable as a document.

The report is being prepared by a cabinet committee headed by Secretary of Commerce Sinclair Weeks. It was started nearly a year ago with the purpose of developing a transportation policy for the Administration. It was scheduled to be completed by Dec. 1.

Some of the opportunities to the private car have been within the government itself. The Department of Agriculture is unhappy about the effect it would have on farmers, and the Defense Department and General Services Administration do not like being deprived of their ability to get advantages from by transporting among carriers.

Shoreline View.—Interior Department is reported to be concerned with the numerous aspects of recommendations that the railroads be allowed to branch out into other transportation industries. Despite all the questions of one industry against its fellow is viewed as a basically issue by political observers. The Administration isn't expected to

have any competition could take.

A basic concern of the report is with the railroads. The Administration's Commission, which controls railroad rates, would have its power increased drastically. It is recommended that the ICC's power to put findings on rates be extended, but that it retain the power to set maximums. Time intervals will be by the ICC in changing rates would also be cut. Other rules are also advocated which would limit the railroads over other forms of transportation.

Report of governmental advantages in beginning for auto among carriers is recommended.

Reinhold Factor.—Another important item in the recommendations that railroads be allowed to engage in the bus and trucking business. This is viewed as a move which could lead to restraint of competition and retard development of independent forms of transport in favor of the railroads.

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U.K. Backlog

Backlog of orders for large British transports now stands 214. The total backlog now stands 280 on British Civil Aviation Corp's order for 24 of the Lockheed Constellation's new Constellation and one modified Constellation (AW Mar 28, p. 19).

The backlog also includes orders for:

- Vickers-Armstrong Ltd., for 128 turboprop-powered Viscounts. Forty one of the order is for transport have been ordered.

- Bristol Aeroplane Co., for 36 long-range turboprop-powered Britannias. Orders have been taken on an additional six.
- Handley Page Ltd., for 29 passenger Handleys.

London Opening New Passenger Terminal

Turboprop engine London Airport's new terminal terminal and building block. Built in spring 1957, it will be completed by British European Airways and 10 continental airlines who together handle 75% of arriving and departing passengers. Control tower is at upper right. Offices, loading, customs, immigration and public facilities will be located in attached building at left. An official building will cost an estimated \$100 million.

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AVIATION WEEK, April 4, 1955

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Civil Airframe Shipments Decline

Civilian aircraft shipments in January amounted to 197,700 lb. in airframe weight. Department of Commerce reports. This compares with shipments of 192,500 lb. in the same month in 1954. The breakdown:

	January 1955	December 1954	January 1954
Complete aircraft	150	79	278
By weight of airframe			
Less than 1,000 lb.	325	273	214
1,000 lb. and more	22	18	14
By number of pieces			
In 1 or 2 pieces	122	365	253
More than 3 pieces	25	25	25
By total lb. of engines			
Up to 350 hp.	37	381	318
400 hp. and more	318	27	25
Total value of completed parts (\$000 omitted)	\$28,381	\$18,535	\$50,498
Aircraft	28,381	12,794	34,862
Less than 1,000 lb.	3,914	3,279	2,896
1,000 lb. and more	19,421	9,524	21,412
Aircraft parts	5,466	5,541	6,335
Total aircraft engines and parts (\$000 omitted)	\$42,351	\$18,585	\$101,497
Aircraft engines	5,996	6,816	6,640
Engine parts	6,796	7,169	6,585

publish a report which would anticipate either the tracking industry in the airlines, both are politically potent.

The fact here which the effects of the committee will take is uncertain. There is a good chance that no document will be produced, but the findings of the committee will come in the form of legislative recommendations. Most observers agree that any proposed legislation would have to be considerably more than currently proposed in order to have a chance of getting through Congress.

New Orleans-Mexico Route Near Decision

Validity of Eastern Air Line's certificate for a New Orleans-Mexico City route, as despite some former President Truman withdrew the authorization in 1952, appears near settlement.

Civil Aeronautics Board rejected the case in the New York-Mexico City non-stop case. Eastern was its point over the objections of the other two applicants in the proceeding—American Airlines and Pan American World Airways.

San Juan Extension—The board directed CAB chairman Edward T. Stroh to accept both from the interested parties, as well as from the airlines and Western Air Lines on the side line of the valid of the certificate of Eastern for a New Orleans-Mexico City route. Both Braniff and Western were included on the basis that similar legal action was taken in regard to certification for Mexico City route to them.

Eastern lost a second round with the Board in a consistent action rejecting an appeal from the company's denial of compulsory attendance of certain witnesses and producing certain documents in the ongoing case. Eastern unsuccessfully sought to have the whole history of U. S. Mexico air route relations since 1946 produced for the record. CAB contended the request was unreasonable in scope and limited its materials.

U. S. Airways—Despite the Board's action the record in the new case is to allow consideration of the validity of Eastern's certificate in some Mexico, CAB did not make a decision on the issue. An alternate decision would have been made by the President.

CAB said it would pass on the validity of Eastern's New Orleans-Mexico City certificate only if it becomes necessary in investigating its recommendations to the President in the ongoing case.

IATA Cuts Air Cargo Rates Across Atlantic

Lower rates on some air cargo shipments between North America and Europe will become effective July 1 under a new rate system adopted by selected carriers of the intercontinental Atlantic route.

The new rating system, International Air Transport Association said, will reduce the several thousand existing special rates for specific types of cargo to less than 50 broad classifications.

20% Reduction—Basic general cargo

rates remain unchanged, but their application to specific types of cargo will be revised, IATA said. The agreement is subject to approval of IATA Traffic Conferences and national governments.

Pan American World Airways predicted that the new rate structure would provide a 20% reduction in rates for commodities representative of 75% of the North Atlantic business.

Walter C. Laperriere, PWA's vice president for traffic and sales, forecast an increase of at least 50% in the trans-Atlantic air cargo business, on the basis of the new rates. Present air cargo business which total 23 million lb. for 12 months in 1954, is expected to total 30 million lb. in the last full year of operation under the new rates, Laperriere said.

John Bracker, IATA's traffic director, said "The standard aim is to make cargo airfreight simpler, cargo more competitive, and cargo rates cheaper."

St. Louis Drop—Pan Am estimated that the change means a drop from an average of 10 cents a pound to 26 cents in the airline's charges.

The present 15% discount for general shipments of 140 lb. or more will be dropped in favor of other bulk discounts within the commodity rating system.

The existing 25% discount for general cargo shipments weighing 100 lb. or more will be retained.

Los Angeles Airport Raises Airline Rent

Los Angeles—Five major airlines holding base leases at Los Angeles International Airport have concluded negotiations with the Board of Airport Commissioners on increasing the terminal facilities and later to be paid by the airlines.

The Airport Commission agreed to expand the terminal space and began work to provide necessary additional passenger handling facilities.

Immediate consideration will be given to the expansion program, and construction is expected to get under way during the current year, according to the Board of Airport Commissioners.

The airlines agreed to pay annually an additional \$97,250, as recommended in the survey made for the Commission by Aviation Services Co. of Minneapolis. It represents the city, but subject to performance report submitted that would be required for each airline in the event of an actual emergency.

CAP members will include increasing reduction from the air over the use of a modern equipment, used exclusive service, customer service and available communication system.

Companies include American Airlines, Pan American World Airways, Trans World Airlines, United Air Lines and Western Air Lines.

Braniff Asks Court to Void Merger

Braniff Airways moved last week to block the merger of Continental Air Lines and Pioneer Air Lines by asking for judicial review of the case.

The U. S. Court of Appeals in New Orleans, La., has been asked by Braniff to review the terms of Civil Aeronautics Board orders dealing with the merger and to stay the effectiveness of the orders until review is completed.

Braniff had already asked the Board to reconsider its action in approving the merger. The CAB voted the merger down. When Continental and Pioneer said they would complete their integration within April 1, Braniff initiated proceedings in the federal court to block it.

Violation—Continental-Southeastern has of revenue is seen as a strong possibility by Braniff if the merger goes through. The carrier estimates losses of \$254,750 annually through increased competition from Continental when it takes over Pioneer's routes and integrates them with its own.

In asking for a stay of the CAB order, Braniff says it would be difficult to get responsible, to "remember" the situation of the carrier goes through and the court subsequently finds the order invalid.

The petition for review asks the court to reverse the CAB as the merger. Braniff says the Board didn't treat the case properly in respect to dealing with the company's objection and is in violation of the Administrative Procedure Act. Then, says Braniff, the order is void.

Timeline—Quickened—The carrier also raises a legal question on the Civil Aeronautics Board's power to transfer Pioneer's certificate to Continental. The Pioneer certificate expired Sept. 30, 1954, but the carrier continued to operate under a law which authorizes such operation while the CAB is attempting to issue a new one.

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to reach a final decision on the airline case.

Braniff contends that such temporary operating authority is not transferable, and that the Civil Aeronautics Board doesn't have the power to order the transfer.

CAB ORDERS

GRANTED

Trans World Airlines a temporary exemption to provide bus transportation to federal representatives of Lockheed Aircraft Corp., Wright Aeronautical Corp. and Hamilton Standard Division, UAC, by means of night departure on the 100th Super Constellation, for six months.

Regina—Continental Airlines permit to serve New Orleans through Western Air Lines.

Midwest Airlines an extension of its authority to serve Keno, N. H., to Apr. 28, 1955.

APPROVED

Interlocking relationship between St. Louis and John H. Allen, a director of St. Louis and vice president of Northwest Airlines.

Agreements between United Air Lines, Eastern Air Lines and Western Air Lines on the subject of interlocking agreements.

APPROVED

Chicago—Helicopter Ltd. in contract to provide night flights between San Francisco, California, and Honolulu, with scheduled May 1, 1955.

APPROVED

Under—disposition an agreement between the Flying Tiger Line and Airborne Freight and Freight Traffic Inc. to clarify the situation.

United Air Lines Route No. 1 to include, D. N. Y., in an intermediate point between New York and Salt Lake City, with effect June 1, 1955.

ORDERED

Suppression of certain fares filed by United Air Lines to be extended to June 28, 1955 to allow added time for investigation.

Suppression of certain fares filed by Northwest Airlines to be extended to June 28, 1955 to allow added time for investigation.

DISMISSED

Rockwell, H., Chairman of Commission's application for review, since the application has been rejected, the Commission.

The Traffic Commission—The Commission, since the most direct air route was not used.

DEFERRED

Problems of the Independent Military Air Transport and the Air Force, since the most direct air route was not used.

SHORTLINES

Allegiance Airlines made on year of operation this month. Traffic has increased from 9,650,000 passenger-miles in 1949 to 82.6 million in 1954 but year's loss increased approximately 35% over 1953.

American Airlines received the National Safety Council's Award of Honor for its 1954 employee safety record. American reports January traffic increased 25% over January 1954. Passenger miles totaled 327,165,000, compared with 261,735,000 the previous January.

British European Airways flew more than 735,000 passengers over its London-Panama route in 1954, a 131% increase over 1953. Increase of about 34,500,000 increased the route would have a net profit for the first time since it was started in 1950.

North Central Airlines had an operating profit of \$50,336 and a net of \$5,747 in 1954, according to the quarterly financial report. The company's January 1954 operations showed a net loss of \$71,900.

Pan American World Airways lost added a third weekly flight between San Francisco and New Zealand via Honolulu and Fiji.

Central Airlines boarded 6,489 passengers last month, a 70% increase over February 1954.

Lacsa, the Costa Rican airline, will introduce two Boeing 480s for its Miami, Panama and Mexico services. April 17. The airline's operations will be increased to five flights weekly.

Biddle Airlines earned 1,392,148 lb. of freight in February, compared with 1,369,527 lb. in January. February 1955, the 12 month period ending Feb. 28. Biddle earned 79,875,131 lb. compared with 15,107,768 lb. during the same period a year ago.

Seaboard & Western Airlines reports a 67% increase in contracted freight tonnage in January and February over the same two months last year.

Southwest Airways set 2,966,662 contract passenger-miles in February, a 45% increase over February 1954. Passenger load factor increased from 51.5% to 60.2%.

Western passenger traffic increased 23% during 1954, freight gained 22% and mail 15%.



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More Wigg Flipping In Britain

AVIATION WEEK's exposure of the incoherent charges on British security leaks by Socialist member of Parliament George Cecil Edward Wigg (AW Feb. 28, p. 94) was introduced on the floor of the House of Commons in London during recent debate on the air intrusions. We quote the text of this debate as reported in the March 10 *Hazard's*, official report of Parliament proceedings.

Mr. Charles Ian On-Longing (Conservative from North Hants): "Would the hon. Gentleman care to comment on the report in 'Aviation Week' which says '... the M.P. from Dudley has flipped his wig. This is a prime example of how a poorly informed politician can befuddle the public on the real military security problem with his rancorous cries of "wof" when no real danger exists.'"

Mr. Wigg: "I gave way to the hon. Gentleman but he has abused my courtesy. I thought that matter would be introduced during the debate and my speech will now have to be a little longer than I intended."

"I shall tell the House why this attack was made on me by 'Aviation Week'. It was because I put down three questions on the Order Paper about breaches of security. There was not much in two of them, but the third one, dealing with infrared, in my opinion, is a gross breach of security. If I am wrong in that I hope one of the members on the front bench will say so."

Wigg's Accusation

"The principal attacked me because the leak about this subject was revealed to a representative of that periodical by a senior member of the Royal Air Force when the member of the staff of 'Aviation Week' was at a luncheon and the RAF officer was speaking off the record. A representative of 'Aviation Week' took this embargo and when I put a question down I was attacked in the American press. I am amazed at that. The American press would not go out of its way to attack me at great length and circulate a copy of what it says in attacking me to the hon. Gentleman on the other side of the house."

Mr. On-Longing: "It did not."

Mr. Wigg: "I was not near the mark."

Mr. On-Longing: "It did not do that."

Mr. Wigg: "It was sent to every paper in London."

Mr. On-Longing: "I read 'Aviation Week'."

Mr. Wigg: "Maybe the hon. Gentleman does, but it did what it did because it got very near the truth. I affirm that major security breach came about as a result of an action of an officer of the Royal Air Force which in certain circumstances I am prepared to reveal to the government. On one condition that they will charge the representative of 'Aviation Week' in the courts with an offence against security and erect material the Royal Air Force officer concerned. If that does not satisfy the hon. Gentleman opposite, I suppose nothing will."

Thus when Wigg is brought to bay he admits there is "not much" in his first two charges of security viola-

tion—one of which came from a public statement by the Canadian Defence Minister and the other from the 1954 SRAC public flying display. If Wigg has the quality of the play that distinguishes most Britons he would candidly acknowledge there is not a shred of truth in these charges.

Instead Wigg attempts to cover his tracks with more charges against *Aviation Week* and the Royal Air Force, knowing full well that his incoherence on the floor of Parliament, should bear fruit in answering the consequences of those falsehoods.

Refutation of Charge

Mr. Wigg clings to his belief that disclosure of infrared guidance is a security breach. Apparently he is not aware infrared was first used for remote guidance in 1944 when the Germans tested it in their Wasserfall air-to-aircraft missile at Peenemünde. This German infrared data along with later work done by the American Air Force and Navy has been known publicly for many years. Mr. Wigg carefully does away from explaining why he believes infrared guidance is a security breach. Then he follows with an allegation that official British military secrets were disclosed to *Aviation Week* by a senior Royal Air Force officer at an "off-the-record" luncheon and that *Aviation Week* violated the officer's confidence.

Both statements are false. No *AVIATION WEEK* staff member attended a luncheon either on or "off-the-record" at which a senior RAF officer was the speaker or at which British secrets were disclosed. Consequently no information on an infrared missile could have been transmitted that way. Nor could *AVIATION WEEK* have possibly violated an RAF officer's confidence. Either Wigg received gross misinformation or he has fabricated this story from the whole cloth.

RAF Integrity Secure

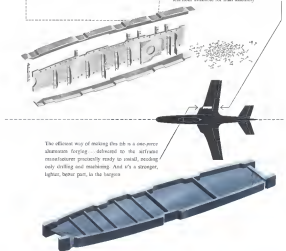
AVIATION WEEK has dealt with many senior and junior officers of the Royal Air Force during its eight years of coverage of British aviation and has found them to be zealous protectors of their country's security on the ground as well as in the air. Wigg's accusation slanders the integrity of his country's valiant defenders. *Aviation Week's* integrity as a supporter for confidence is too well known among the military, aircraft industry and government officials who deal with it regularly to suffer any harm from Wigg's irresponsible statements.

If Wigg is an honorable man he will apologize to both the Royal Air Force and *Aviation Week* for his slanderous charges and publicly withdraw them. If he does not, we ask him to step down from the Parliamentary immunity that now protects him from the due process of law and to repeat these charges publicly where he can be brought to book for them.

—Robert Hots

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